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III. THE SOLDIER'S FOOT AND THE TREATMENT OF COMMON DEFORMITIES OF THE FOOT.

BY

LIEUTENANT-COLONEL ROBERT JONES, CH.M., F.R.C.S.I. (HON.),

INSPECTOR OF MILITARY ORTHOPAEDICS, ARMY MEDICAL SERVICE.

PART I.—FLAT-FOOT.

THE foot must be regarded for our present purpose as consisting of two parts: The hinder part, behind the mid-tarsal joint formed by the os calcis and astragalus; and the fore part, in front of that joint, consisting of the rest of the tarsus, the metatarsus and the toes.

The Three Arches of the Foot.

The hinder part of the foot is designed to carry the body weight when standing. The os calcis and astragalus are strongly bound together by ligaments, and the astragalus is securely set between the two malleoli at the ankle-joint.

The fore part of the foot is much more mobile, and is designed to give spring to the foot when walking. This spring depends on the efficiency of the small muscles of the foot, on the integrity of the longitudinal and transverse arches, and on the freedom of movement of the toes themselves.

Regarded as a base of support, the foot is a tripod resting on the heel, the head of the first metatarsal bone, and the heads of the fourth and fifth metatarsal bones. Each side of the triangle formed by these three points is arched. The outer side formed by the os calcis, cuboid, and the fourth and fifth metatarsal bones is so slightly arched that practically the whole length of it rests on the ground when standing. This element of the foot is therefore not very susceptible of strain, and need concern us no more.

The inner side is strongly arched; the arch runs from the heel upwards and forwards to the neck of the astragalus, then downwards, forwards, and *inwards* through the scaphoid, internal cuneiform, and first metatarsal bones to the ball of the great toe. This arch, which varies in height in different individuals, is composed of a number of bones, is very susceptible to strain, and is in consequence the seat of a number of disabilities which we shall group together as "flat-foot."

The third side of the triangle runs from the head of the first metatarsal bone to the heads of the fourth and fifth metatarsal bones, and forms the front part of the transverse arch of the foot. It must be remembered that this transverse arch extends backward throughout the whole of the forepart of the foot. The cuneiform bones and cuboid bones are arranged in a transverse arch as well as the metatarsal bones.

Deformities and Disabilities of the Foot.

In considering deformities and disabilities of the foot due value must be given to its various mechanical elements—that is to say, not only to its bony structure but also to the muscles and ligaments which help to maintain its shape.

Looked at in this way we find among the deformities and disabilities of the toes such conditions as hallux rigidus, hallux valgus, and hammer-toe, and we note that the two former in particular are frequently associated with some degree of flat-foot.

Impairment of the transverse arch is specially apt to be associated with the painful condition known as metatarsalgia.

Impairments of the longitudinal arch are associated with a train of symptoms which are found in the various degrees of weak foot, everted foot, and flat-foot.

All these types of derangement of the mechanical elements of the foot and the resulting disabilities depend on strains about the complicated series of joints in the fore part of the foot.

In the hind part of the foot the disabilities are fewer. They are mainly connected with painful conditions of the heel, due to such conditions as strain of the insertion of the tendo Achillis, or periostitis of the os calcis, due to trauma or sepsis.

When a clear idea of these several disabilities and of the measures suitable for the prevention or treatment of each has been obtained, it will be more easy to grasp and understand the various disabilities of the foot to which the soldier is liable, always remembering that two or more types often occur simultaneously, and that all must be appropriately treated.

Flat-foot.

The term "flat-foot" may be taken as a generic term to include all degrees of strain of the longitudinal arch of the foot. To these various conditions different names have been given, which need not detain us here. The point to be understood is that all degrees occur, from slight strain of the ligaments and tendons by which the arch is maintained to complete descent of the arch with osseous deformity, obvious to the most casual observer.

The essential fact in the deformity is abduction and eversion of the fore part of the foot (Fig. 1). If it commences as a sudden acute condition, it is associated with strain of the inferior calcaneo-scaphoid ligament; to this is due the tenderness elicited on pressure on this ligament just below the tubercle of the scaphoid. This tenderness is characteristic. Pain in this situation is often most acute in patients who have naturally a very high arch. When such an arch begins to give way the strain on the "spring" ligament is great and the pain correspondingly severe, but the foot is not physically flat, for the arch may still be higher than is normal in most people.

FIG. 1.—Flat everted foot.

As the foot becomes more strained under continued exercise, the bones of the tarsus begin to descend and pain is complained of across the dorsum of the foot.

Finally, when the deformity becomes still greater, there may be pain on the outer side of the os calcis below the tip of the external malleolus. This is probably to be attributed to bruising of the periosteum due to the os calcis impinging on the malleolus; in some cases an adventitious bursa is ultimately produced in this situation.

Acute Flat-foot.

All the above symptoms, and also actual descent of the arch with pronounced abduction and eversion of the foot at the mid-tarsal joint, may come on with great rapidity and then be associated with very severe pain, so that the patient cannot walk and can hardly bear to have the foot touched. Such a condition may fairly be described as acute flat-foot. It occurs in its typical form in people who are in poor physical condition, as, for instance, after an attack of influenza, and return too soon to work which involves much standing and lifting of weights—for example, hospital nurses. It occurs in exactly the same way in the recruit. Take, for example, the clerk who has taken little exercise and who has been in the habit of wearing boots in which there is no room for movement of the toes and bones of the fore part of the foot; all the muscles and ligaments controlling and supporting the arches of the foot are weak and out of condition from want of use; under the strain of hard drill they give way.

Treatment of Acute Flat-foot.

The treatment of such a case falls into three stages.

First Stage.—If the foot is acutely painful the patient should be put to bed and the feet gently massaged for two or three days till the acute tenderness passes off. During this time he must never be allowed to set foot to the ground, for the weight of the body would again strain the ligaments.

Second Stage.—As soon as the acute tenderness has passed off, the foot should be adducted and inverted so as completely to restore the arch, and the foot kept continuously in this position to allow stretched ligaments to shorten and become adapted to the correct position. Mere rest in bed is not enough, for then nothing is done to restore the proper shape of the arches, adaptation takes place in the flat-foot position, and the patient is left with a real flat-foot. It is often best to mould the foot into correct position and fix it in plaster-of-Paris for about ten days to allow the strained ligaments to recover completely.

Third Stage.—When the plaster is removed, after, say, ten days, the patient's foot is exercised—first of all by massage and exercise, particularly movements of the toes and inversion movements, never eversion movements. These inversion movements are intended to strengthen the muscles controlling the arch.

Boots.

The patient is allowed up in specially altered boots. The boots should grip comfortably round the ankle and heel, but the whole fore part of the boot should be roomy to allow free play of the small muscles inside the boot.

FIG. 2.—Boot with straight inner border, crooked and lengthened heel, patch to thicken sole.

Pointed toes are very harmful, as they abduct the fore part of the foot and help to produce the condition of flat-foot. The inner side of the boot should be straight, so that when the two boots are placed side by side the inner sides are parallel right forward to the great toe. This is not the conventional boot of the shoemaker, but it is the correct boot for a strong foot.

The present army boot is not perfect, but it is much better than it was some years ago.

Having seen that the boots are of suitable shape, they should be sent to the shoemaker to have the heels "crooked" on the inner side. By this is meant that the heel of the boot is made a third of an inch higher on the inner side, and tapering gradually to its outer side, so that the inner side of the heel is a third of an inch higher than the outer side. In addition, the length of the heel should be extended forwards by three-quarters of an inch on the inner side, and the sole should be raised one-third of an inch by a patch on the inner side of the sole just below the toe-joint (Fig. 2).

The patient must never put foot to the ground without an altered boot or shoe on, otherwise he will unwittingly let his arch descend and so inflict a fresh strain on the ligaments.

The man should then be instructed to walk with feet parallel, not with the toes turned out. The altered heel helps the patient to keep his toe turned in. Exercises should be graduated till the man is fit for full duty.

A bad case of *acute flat-foot* should be fit for light duty in three weeks, and for full duty with the *heels of his boots raised on the inner side* in six weeks to two months.

It is really a question whether the army authorities ought not to issue all boots with heels raised on the inner side, as this is a great relief to the foot on a long march and increases the man's weight-carrying and lasting power.

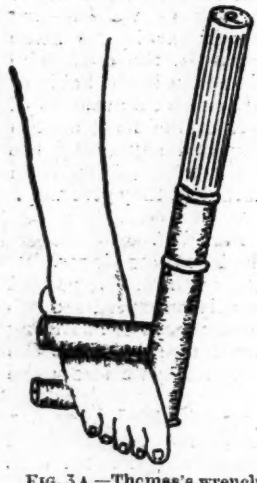


FIG. 3 A.—Thomas's wrench applied to invert everted foot.

FIG. 3 B.—Showing the position of the foot and direction of force at end of correction to inversion.

Certainly all recruits with weak feet should be started off with crooked heels on the boots until the muscles of their feet get into training. They should also be taught to walk with their feet parallel. If this were done the feet would grow stronger rather than weaker, and considerably fewer men would require to be taken off duty.

Traumatic Flat-foot.

Flat-foot in every respect similar to that just described as acute flat-foot may arise from injury. For example, when the wheel of a trap runs over a man's foot and strains all the ligaments.

Flat-foot from Periarthritis.

Similar mechanical conditions arise in gonorrhoeal periarthritis when all the ligaments are sodden with exudate, become soft, and stretch. The same is true when the infection is of an ordinary septic character, for if the man puts weight on his foot before the arch is restored to its strength he will get a flat-foot. He can, however, walk with safety in a boot with the heel well crooked almost as soon as the disappearance of pain allows him to put his foot to the ground.

Rigid Flat-foot.

These cases lead us naturally to the rigid form of flat-foot which results from neglect in the acuter stages, whether the cause of the sudden yielding of the ligaments be overstrain due to unaccustomed exertion in walking, to injury, or to weakening of the ligaments by the products of infective agents.

FIG. 4.—Outside iron in addition to crooked long heel and piece to sole.

The foot, therefore, should be maintained in the inverted and adducted position during recovery from the acuter conditions, and when the patient begins to walk the body weight should be deviated from the inner to the outer side (Fig. 2). If this important routine should be neglected the recovery of ligaments will occur in a flat-footed position with stiffness in all the joints. The patient in that case cannot stand on the outer edge of the foot or turn it into an arched shape.

Treatment is very simple, but must be thorough. The foot should be wrenched so as to break down all adhesions and make it thoroughly pliable (Fig. 3). The foot is by this means converted into an acute traumatic flat-foot, and it must undergo the course of treatment already described for that condition. It should be moulded into the correct position, and plaster-of-Paris applied. After two or three weeks of such rest, to allow recovery from the trauma, graduated exercise may be taken in boots so altered as to deviate body weight from the inner to outer side of tarsus. An outside iron is often found a great assistance in maintaining the correct position of the foot during walking (Fig. 4).

Osseous Flat-foot.

A real stiff flat-foot which has been neglected for years becomes an "osseous flat-foot"—that is to say, changes occur in the shapes of the bones to adapt them to the erroneous position. Though something can be done to improve such cases, they cannot always be made fit to be soldiers; the surgeon must, however, be sure that he is dealing with real osseous change and not merely with a flat-foot which is rigid owing to ligamentous contractures and adhesions.

FIG. 5.—Peroneal spasm producing a flat everted foot.

Flat-foot due to Spasm of the Peronei.

I described this condition many years ago (Fig. 5), and stated that it was by no means uncommon. It may be found in any out-patient department if looked for, and I have operated upon as many as 150 cases in one year. It occurs usually after puberty and in early adolescence; it is common among the robust, not only among the weakly, and is not associated with the temperament known as neurotic. I will describe a typical case. A young man

of 18 limps with a springless gait into the out-patient room. He walks with feet practically rigid and with toes pointing out. They are both everted, and the inner border over the region of the scaphoid appears thickened and even angular. Both the character of the walk and the appearance of the feet might lead to the diagnosis that osseous changes were advanced. On being questioned the patient may give a history of injury such as a fall on the feet; usually he cannot account for the origin of his trouble. The pain is often acute, the feet may perspire abnormally, and the patient may not be able to walk more than a short distance. Relief is experienced on removal of his boots; if he is asked to invert his foot he cannot do it, and when he attempts to do so the peronei become rigid. The surgeon when he examines the foot manually finds there is pain on pressure over the deltoid ligament, over the scaphoid, and over the tip of the external malleolus, where it impinges upon the os calcis, and tenderness over the peronei along the outer border of the foot. If the surgeon gently attempts to invert the ankle much pain is experienced and the peronei, so to speak, immediately place themselves on guard and strongly resist the surgeon's efforts. Now while the surgeon has firm hold of the foot, let him engage the patient in conversation, at the same time gently press in the direction of inversion. Then at the psychological moment, while the peronei are quiescent, very suddenly and very forcibly let the foot be inverted and held there. It is a very painful movement, but the character and contour of the foot is completely changed. It is no longer rigid, osseous changes are obviously absent, and the general appearance of the foot is almost normal. The moment the surgeon releases his hold, the old rigidity and deformity return.

For this condition mechanical measures are of no avail. The patient must be anaesthetized to relax all spasm, and about three-quarters of an inch of each peroneus should be removed about an inch and a half above the maleolus (Fig. 6). The foot must then be fixed for about three weeks, well inverted and adducted at the mid-tarsal joint, and later the ordinary treatment for flat-foot. My old house-surgeon, Mr. Naughten Dunn, secured equally good results by pinching with a pair of forceps the nerve as it enters to supply the peronei. Simple tenotomy of the peronei is not sufficiently drastic to prevent recurrence of deformity.

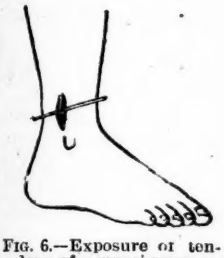


FIG. 6.—Exposure of tendons of peronei preparatory to exsection of about ¾ in.

Diagnosis.

It is not an easy matter to lay down rules for a hard and fast differential diagnosis between these types of rigid feet, but the following considerations will help.

An osseous flat-foot which has become adapted to its new position is usually strong and painless.

A flat-foot rigid from adhesions and shortened ligaments is still susceptible to strain, and is liable to become painful after unusual exercise.

The type due to a spasmodic contraction of the peronei is characterized by pain, and the spasm may be overcome in the manner I have just indicated.

In the two last varieties, after the deformity has been over-corrected for a time, energetic massage and a correct deviation of body weight are essential elements in bringing about a cure. The osseous type, once the bones have completely dropped, may not only be painless, but may be strong enough to bear the strain of long marches. Wounded soldiers may constantly be met with whose feet are very flat, whose mid-tarsal joints are fixed, but who have undergone several months of hard training without a complaint. If in addition to these osseous changes the power of inversion of the foot is lost or the peronei are in spasm surgical attention is urgently called for.

The flat-foot for clinical purposes may be divided into two classes.

(*a*) The foot which the patient can invert.
(*b*) The foot which he cannot invert.

The first class will not respond to any mechanical treatment, such as a plate or alteration of the boot. It will not even suffer correction by means of a bandage to an outside iron from knee to heel. An operation, or forcible manipulation and fixation under an anaesthetic, are essential preliminaries to the simpler mechanical methods.

The second class will never require an operation.

This simple clinical division should be helpful to the military surgeon.

Subacute Flat-foot (Ordinary Flat-foot).

The stage of flat-foot most commonly seen is neither an acutely painful foot too tender to be handled, nor a rigid flat-foot, but an intermediate stage, which may be called subacute.

The patient's feet give him little trouble in ordinary life, but a long walk makes them ache round the instep. When he goes to bed after a hard day's exercise his feet are apt to get stiff. Next morning they are stiff and painful when he gets up, but as he moves about this passes off; but later in the day, especially if he has to do a lot of standing and walking, the feet again become very painful.

Diagnosis.—This is made by considering the patient's history and by finding distinct tenderness on pressure below the tuberosity of the scaphoid; there may or may not be pain in other localities. Finally, the patient can voluntarily stand on the outer edge of his foot and can crook his foot into the arched position. This last point is very important, for it means that the patient will recover if the heels of his boots are crooked so as to deviate body weight on to the outer side of the foot.

The case should therefore at once be put through the last stage of treatment described under acute flat-foot—namely, graduated exercises—and he need not be taken off duty for more than a day or two while his boots are being altered. "Contrast baths" of hot and cold water alternately, to stimulate the circulation of the foot, are a great relief to the patient, especially at night, when his feet may be a little sore and swollen after having been walking about all day.

Conclusion.

I have purposely avoided all mention of tiptoe exercise. These exercises are excellent, but they will not cure a flat-foot if the patient is allowed to come down in the flat-footed position between the period of exercises.

If the principle of deviation of body weight on to the outer edge be loyally adhered to every ordinary case will recover, even without special tiptoe exercise. Loyal adhesion to the principle stated means that the patient never sets foot to the ground except in a properly crooked boot, shoe, or slipper. Even in his bath he must be careful to stand on the outer edge of the foot. The whole idea of treatment is to ensure that uninterrupted adaptive shortening of stretched structures shall take place.

Massage, tiptoe exercises, electric stimulation of muscles all help to hasten the recovery, but a few minutes' careless walking in stocking soles will undo all benefit from other treatment by again stretching recovering structures.

Frequently the high arched foot is the most troublesome type when the tendons are strained and the ligaments begin to give. The strain upon the astragalo-scaphoid joint in this type is, for obvious mechanical reasons, great, and the progress of the affection is often marked by a prominence about the scaphoid due to pressure osteitis.

THE census bureau of the United States Department of Commerce recently issued a summary of its statistics of causes of death in 1914 in the registration area, which comprises 435 cities and towns with populations ranging from 10,000 to 100,000, and represents about two-thirds of the total population of the United States. The total number of deaths was 898,059. Of these, 99,534 were due to diseases of the heart; 96,903 to tuberculosis (of disease of the lung in 84,366 cases); 83,804 to pneumonia; 67,545 to Bright's disease and nephritis; 52,420 to cancer and other malignant tumours; 52,407 to diarrhoea and enteritis; 51,272 to apoplexy; 15,044 to arterial diseases of various kinds; 11,786 to diphtheria; 10,666 to diabetes; 10,185 to typhoid fever; 15,617 to whooping-cough, measles, and scarlet fever. The statistics show that from 1904 there has been a continuous decrease in the mortality from tuberculosis and typhoid fever, while since 1900 there has been an almost continuous rise in that from cancer and diabetes.

THE CAUSES AND PREVENTION OF TRENCH FOOT.

BY BASIL HUGHES, M.B., F.R.C.S.,
CAPTAIN R.A.M.C.(T.F.).

THE pathologic condition which has been called "trench foot" has given rise to considerable discussion, and from time to time articles by different observers have been published in which various suggestions for its treatment have been made.

The importance of the discovery of the true cause of this condition can hardly be exaggerated, whether it be regarded from the point of view of the internal economy of the service, or that of the permanent disability that may result to the men so attacked.

Despite the conscientious following out of treatment recommended, numerous cases continue to occur, and, in consequence, much thought was given to the condition in the hope that the true cause might be found.

From October to the end of December, 1915, I was attached to a regiment which was holding a section of the line where the conditions were extremely bad. During August and September and July I had been attached to other regiments in the same salient, but the conditions during these three months were not comparable to those obtaining from the latter part of October to the end of December. During the earlier months the dug-out accommodation was good, and men could lie down during the day time; but during the later period many of the dug-outs had either fallen in or had been blown in, the parapet in other places had fallen in owing to the wet, and owing to difficulty in finding suitable soil it was not always possible to repair it. The men, therefore, during the day were unable to move about, and either had to stand or crouch until nightfall. At night they usually slept in a sitting position, when they slept at all.

The first case of trench foot I saw in October was that of a bomber who had been on duty through the night in a wet sap; and the next three or four cases were also of bombers who had been on duty in this sap, and the succeeding cases were sentries who had been in and about the entrance to this sap.

In all these cases the history was identical. The man had felt little inconvenience, except that the feet felt like "pins and needles," and had "gone to sleep." There was time and opportunity for one man at a time to sit down and get his feet up, but this particular sap was in such a bad condition that the one man who could sit could not get his legs up.

On coming off duty in the morning they were able to take their boots off, rub their feet, and turn in to a dug-out. In some of the dug-outs they could lie at full length, in others they were semi-recumbent. During their sleep, despite the fact that their puttees were off, their socks changed, and bootlaces slack, the feet swelled, became red and tender, and the circulation in them was sluggish. The oedema was soft and pitted on pressure. On putting their boots on again these men were unable to walk.

Another class of case I saw was in men who had been on sentry-go. They felt pain in and under the great toe; it spread rapidly to the heel and then along the outer border of the foot. This pain frequently came on during the resting period. Examination showed that the feet in the parts mentioned were red, tender, hot, and to some extent swollen; the condition resembled more the beginning of an acute inflammation than in the preceding cases.

Stage I.—The two above mentioned types of cases were seen in men who reported their condition early and may be called Stage I. It would seem that the exudation causing the oedema in the foot takes place first of all deep to the plantar fascia and extends to the dorsum of the foot, for the same reason that an inflammatory exudation deep to the plantar or palmar fascia usually manifests itself in oedema of the dorsal surfaces. The soles of the feet were very tender to deep pressure.

Stage II.—Men who did not report early, but persevered in treating themselves, and at the same time tried to do their share of duty in the trenches, presented a condition of the feet which differed materially from the stage already described. These men invariably reported twenty-four hours after the first stage had set in. Almost without exception they told of the rapid onset of the initial swelling of their feet during the resting period, and that while on duty prior to their feet swelling they had noticed no inconvenience beyond some numbness and "pins and needles." The foot was swollen and cold, and the condition sometimes, though rarely, extended to the ankle and slightly above it. Pain was never a marked feature; loss of sensation seemed to take its place. The oedema was of quite a different kind, there was no pitting on pressure, and the feel imparted to the hand was that of a solid rubber ball. Circulation as tested peripherally was extremely sluggish, and in places about the toes it was questionable if it existed, but doubtless it did. This condition might be called Stage II.

Stage III.—The last and final stage is that in which gangrene supervenes. Fortunately, I met with no such cases in my own regiment, though I saw cases of this sort that had reached the hospitals in England late in 1914 and early in 1915.

After the occurrence of the first of my cases I went to the sap from which they had come. I examined the boots, socks, and feet of the men, the adjustment of their puttees, and was soon convinced that the rubbing of the feet was being most conscientiously seen to. The boots were letting in the thick soupy mud over the tops, and in some cases the fact that the tongue of the boot had not been stitched sufficiently high up made the letting in of this liquid mud the more easy. The socks were being frequently changed. In most cases two pairs were being worn, and the boots issued were a size larger than were normally required.

The only cause, or exciting cause, that could then be suggested was the soupy mud of the trenches, and its infective nature; it had come in contact with decomposing organic matter, which was present almost everywhere, and could neither be removed nor kept covered for any length of time owing to the enemy's artillery.

I then ascribed the condition to some infective agent, and set to work to examine cases more closely from this point of view. The socks of the men who came down with this condition had a faecal odour resembling that of wounds infected with the gas bacillus, but other men's socks, including my own, had the same odour, though there was no trace of trench foot. The smell was to be ascribed to the multiplication in the socks of organisms which got into the boots with the liquid mud.

Rubber knee boots were then issued to the men, and attention was paid to the socks being clean and dry. Rubbing the feet was persevered with both with anti-frostbite grease and whale oil. In addition, whenever possible, the men were given exercise. Yet, though the men's feet were saved from coming in contact with this liquid mud, still the incidence of "trench foot" did not abate.

It was at about this time that an article was published in the BRITISH MEDICAL JOURNAL ascribing a microbic cause for "trench feet." Interesting as it was, it was apparent now to me that bacteria were not the cause of the condition, and it was evident that the cause must be looked for in some other direction.

As times were now hard in the trenches, I thought of fatigue and consequent collection of waste products of metabolism in the cellular tissues of the lower extremities. This was very possible under the then existing conditions. It seemed reasonable to suppose that fatigue with stagnation of products of katabolism in the lower extremities might act as a predisposing cause, and cold and wet as the exciting cause. The symptoms and onset seemed to fit with this view, and a scheme on new lines was instituted. Hot soup, made from the bones of the fresh meat issued together with meat-extract cubes and vegetables, was sent up to the men in the trenches each night. The fresh meat was cut off the bones at the transport lines, passed through a mincing machine, and was, with the service biscuit, made up into most appetizing rissoles. These were cooked in the transport lines and sent up to the trenches, where they were heated up by the men in their mess tins. All suet fat was saved, and this, with flour and raisins bought from the profits of the dry canteen, was made up into plum-duff, which was exceptionally palatable and of high caloric value. On other days, where mutton had been an issue, Irish stew was made, and small suet dumplings included in it. It was served hot to the men in the trenches.

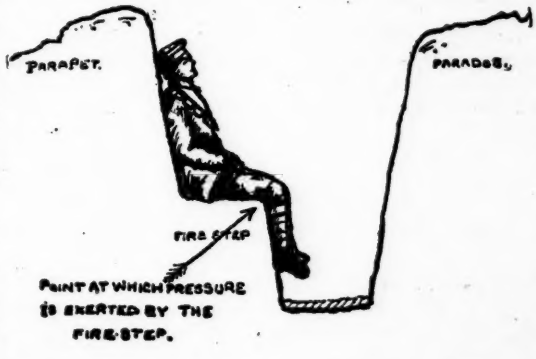
I will not go into the daily menu arranged by the commanding officer for the men, beyond saying that the rations were made most appetizing and were used to the last calorie; nothing was cast aside, the profits of the dry canteen being used to buy vegetables, flour, raisins, etc., by which means every particle of fat was turned to useful purpose. The soup made from the bones, etc., was excellent and was served most nights in the regimental head-quarters mess.

With this feeding the health of the men improved. There was less sickness; in fact, sick parades were for men in the trenches, under the conditions then existing, extraordinarily small, and incidentally the number of cases of trench foot began to fall. At this time an issue of long rubber boots had been made, and the men's feet were protected from trench mud, though not from wet, as socks got wet owing to condensation in the boot. The fact, however, remained that the number of cases of "trench foot," Stage II, fell.

This suggested that by an improvement in the general health of the men, by giving stimulating hot drinks at night with a rum issue at stand-to in the morning, and by the wearing of long rubber boots, we might hope to get rid of the condition entirely.

In this we were again disappointed, for though the number of Stage II cases fell almost to *nil*, yet a number of men paraded with painful swollen feet, that is Stage I, though their number was smaller than formerly. They were sent to hospital, and returned at the end of ten days, only frequently to relapse again. In the end those men who showed tendency to relapse were given employment further back, where they could turn in at nights, and under these conditions the trouble did not seem to recur.

We left that portion of the line at the end of the year, and went to another part where the trenches were in good condition, and were deep, so that men could move about during the day time. The weather, however, was bad, with much snow, frost, and wet.



I was doing my round of the trenches the first night we got in, and incidentally stopped to rest on the fire-step with my legs hanging down. I was surprised to find that at the end of three minutes my feet had "gone to sleep," there was the sensation of pins and needles, and the feet felt numbed. Thinking this might be a coincidence, I tried it on two successive occasions, only to find the same thing happened each time. After the third time my feet in the morning were tender, and decidedly swollen, so that I could not get my boots on. I stayed in my dug-out the next day with my legs raised, and had my feet rubbed frequently. At the end of forty-eight hours all swelling and pain had gone. This experience caused me to go round at night and insist that when men were on duty in pairs the man whose turn it was to rest should lie with his feet up on the fire-step. Every man had a blanket; so that each man resting had two, his own and that of his acting partner. By this means every man resting did so with his feet up, and he had his great-coat and two blankets to cover him.

It was a pleasant change to see these men sleeping, and to find that they were warm and comparatively comfortable.

Though the weather we have experienced in the trenches has been most inclement, yet since taking this precaution we have had no cases of trench feet over a period of twelve days in the trenches. This is not a coincidence, I think; the unit which occupied the same trenches before us had several cases.

From the accompanying illustration it will be seen how congestion of the feet may readily be brought about by a man sitting on the fire-step and going to sleep. The sharp edge of the fire-step can exert considerable pressure over the popliteal space, and so impede the return of blood along the popliteal vein, without stopping the flow along the popliteal artery, and the soldier who is not on duty will invariably go to sleep sitting on this step, unless he is watched and warned to the contrary.

From the results and observations in the trenches, I have come to the conclusion that two factors are at work in producing trench foot:

1. A predisposing factor, namely, fatigue.
2. An exciting factor which is purely mechanical, namely, venous stagnation and consequent exudation of material into the tissues of the foot.

The condition may be classed in three stages, as follows:

Stage I, or the stage of congestion, brought about by resting, especially after any exertion or long standing, with the legs down. This is brought on more quickly if fatigue is in any way present, as after long standing while on sentry-go, when the lower extremity contains waste products of katabolism, so facilitating exudation from the capillaries into the connective tissue spaces. It will easily be seen how sitting on a fire-step, with the legs hanging down, would favour this, specially where there is some pressure exerted on the popliteal vein. The symptoms of Stage I have already been alluded to.

Stage II, or the stage of coagulation. Here the exuded material appears to have undergone coagulation. This, again, would be hastened and favoured by the presence of toxic katabolic products in the intercellular tissues. The feel of the foot in this condition, like to that of a solid india-rubber ball, coldness, and loss of sensation, marks some radical change between this stage and Stage I. Further, ordinary rubbing and massage seems to have but little influence on this condition, and electric vibratory massage combined with effleurage seem to be the only agents for removing the exuded material.

Stage III, or the state of gangrene, is brought about by the pressure of this exuded material on arteries and veins. There is thrombosis in the smaller venules, and such would be hastened by the presence of toxic katabolic substances present.

TREATMENT.

The whole plan of treatment aims at prevention. If once the condition has progressed to Stage II, then the case necessarily passes out of the hands of the regimental medical officer, and colleagues further down the line can better speak of the treatment of the condition than I. The same applies to cases that have progressed to Stage III.

What concerns us who are working in the front line is prevention and the treatment of Stage I, which is the stage of congestion.

Prevention is attained by insisting, whenever possible, that the men while resting should do so with their legs elevated. This cannot too strongly be impressed on officers commanding battalions, the second in command, and especially company and platoon officers. In addition to this, a nightly tour of the trenches, to convince oneself that such recommendations are being carried out, is essential. A daily tour is not necessary from this point of view, as most of the men are sleeping in their dug-outs in the recumbent posture.

One blanket per man should be insisted on, so that the sentry resting at night on the fire-step has two blankets to roll himself in and lie with his feet up on the step.

Hot soup and rum ration are, in my opinion, valuable assets for the general vitality in trench life; and other little alterations in the method of serving up the daily ration have already been referred to. Attention to this is all-important in warding off fatigue.

These points seem small and perhaps tending to "spoil the soldier," but, in my experience, they are thoroughly appreciated and call forth better spirit and better work, and have done much to ward off fatigue.

Rubbing of the feet does no harm and may do good, but the good, I think, comes from the fact that the men change their socks after doing it.

Let me here repeat that the main points in prevention are:

1. Keep the feet raised whenever possible so as to prevent stagnation, especially after a period of standing while on sentry-go or in a listening sap.

2. Keep the soldier fit by getting the full calorific equivalent out of his ration, thus keeping the blood pressure up and "warding off fatigue."

If congestion (Stage I) has occurred, I have always detained the men at the regimental aid post for twenty-four to thirty-six hours. If a regimental aid post has not existed in the part of the line to be held I have immediately made one, and have always been supplied with a fatigue by the commanding officer to erect it in minimum time. This dug-out will usually accommodate six to eight men, and timely massage with rest have rendered the men fit to go back to trenches in thirty-six hours. They report each day for three days for further massage, and at the end of this time, with instructions as to the keeping up of their legs whenever possible, I have had no further trouble.

By this means many men were kept in the firing line who would otherwise have been temporarily lost to the unit, and this is a point the importance of which need not be emphasized.

I have to thank my commanding officer for the kind help and co-operation he has shown in this endeavour against "trench foot," and I have every confidence that we shall be able to face another winter campaign with a minimum of men going down with this condition.

The remarks and suggestions made in this paper may not be new to many, but what I have written has been the result of careful and persistent investigation of my own cases, which at first were considerable in number, but which have, I am glad to say, been reduced to *nil*.

THE EXCYSTATION OF ENTAMOEBA HISTOLYTICA (TETRAGENA) AS AN INDICATION OF THE VITALITY OF THE CYSTS.

BY

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In the course of an experimental investigation undertaken to ascertain the value of emetine as a prophylactic for amoebic dysentery we have found kittens extremely refractory to the cysts of *E. histolytica* (*tetragena*)—that is, only a very small proportion (one out of twelve, after a three weeks' incubation period) of those fed with faeces containing large numbers of cysts become infected. We were thus led to endeavour to cultivate the Entamoeba from the cysts in order to obtain, if possible, stock cultures of active forms for rectal inoculation. Owing to the fact that we are going abroad very shortly, this work has now to be broken off for the time being. As we have found a method of causing the cysts present in the faeces to excyst and liberate the contained Entamoeba, we think it worth while to indicate briefly the results obtained, since this method furnishes the most reliable, and, indeed, the only conclusive, evidence of the vitality of the cysts. This is a point of the utmost practical importance as bearing upon the duration of life and the infective power of the cysts under varying environmental conditions.

A sample of faeces containing a good infection with cysts is well emulsified with saline (or water) and filtered through three or four layers of fine gauze, to remove the larger faecal particles. The filtrate is then centrifugalized and the deposit washed three or four times, the supernatant liquid, which contains large numbers of bacteria but no cysts, being pipetted off each time. By this means toxic products are removed and the cysts are concentrated in a mass of fine faecal débris. As excysting agents we have tried pepsin, in an acid medium, bile, and pancreatic extract, either alone, consecutively, or together, as appeared indicated, but the only success we have had has been with pancreatic extract used alone. The preparation used is Benger's *liquor pancreaticus*. A mixture is made up in the following proportions: Nutrient broth 5 parts, liquor pancreaticus 2 (or 3), cyst-containing sediment 1 part. This mixture is then incubated for five to seven hours at 37° C. At the same time a drop of the mixture is placed on a slide, covered, and the cover-slip ringed to prevent evaporation; this is also incubated. This observation-preparation serves as a control to the tube and can be taken out and rapidly examined whenever desired, to ascertain how excystation is progressing; after five or six hours excystation is usually taking place.

Even of cysts in freshly passed faeces, the majority of which appear quite normal, only a small proportion excyst. The first indication of approaching excystation is that the protoplasm becomes very slightly retracted from the cyst-membrane and appears somewhat crinkled (Fig. 1). By careful watching it can be seen that the contour of the body is very slowly changing its shape, that is to say, the Entamoeba is becoming slightly amoeboid (Figs. 2, 3). The nuclei are not visible; it may be pointed out that when the nuclear rings are clearly visible in a fresh *tetragena* cyst, it is a sign that the cyst contents are dead; in this respect the *tetragena* cyst differs from the cyst of *E. coli*. Next, the periphery of the body becomes applied to the thin cyst membrane in the region where the wall is about to be dissolved (Fig. 4). Dissolution of the cyst-membrane takes place over a small area only. It is brought about, we consider, by the action of external influences; for example, the pancreatic juice, probably helped to some extent also by bacterial ferments present in the intestinal contents.

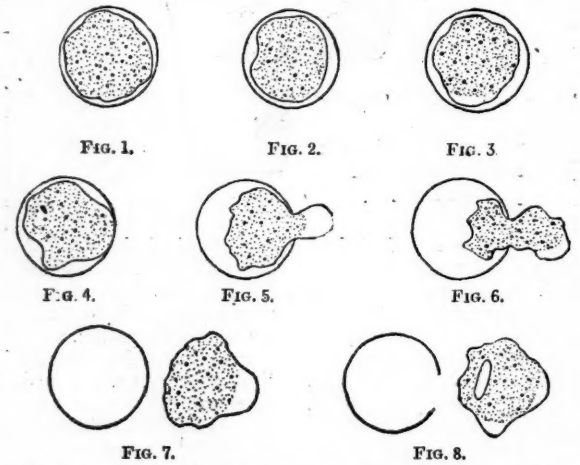

Fig. 1. Fig. 2. Fig. 3

Fig. 4. Fig. 5. Fig. 6.

Fig. 7. Fig. 8.

Excystation of *Entamoeba histolytica* (*tetragena*); from sketches made at the time of observation. Figs. 1, 2, and 3, Slight amoeboid changes within the cyst. Fig. 3 shows a slight development of ectoplasm (this is unusual, and only seen if excystation is apparently delayed). Figs. 5 and 6, Emergence of the Entamoeba through an aperture in the cyst membrane. Figs. 7 and 8, Two liberated Entamoebae, with their empty cysts (seen in optical section); in the latter figure the aperture in the membrane is in focus, and this Entamoeba possesses a "chromidial block" (the endoplasm is dotted to indicate its finely granular character; the ectoplasm is left clear).

In the next stage (Fig. 5) the Entamoeba is beginning to emerge from the cyst. A small protuberance, often finger-like, is thrust out through the aperture; it may appear clearer than the bulk of the protoplasm, and be mainly ectoplasmic in character. The whole of the protoplasm now gradually flows out of the cyst (Fig. 6); the entire process of emergence may take only about ten minutes, though it may take longer. In every instance which we have observed, the entire protoplasm comes out as a single Entamoeba; there is no indication whatever of division while still inside the cyst. We are strongly of the opinion that this is the normal method of excystation. It may be mentioned that tyrosin was always present to saturation in the liquor pancreaticus which we used, the white deposit which is usually seen at the bottom of a bottle of this preparation (after keeping for a while) consisting of pure tyrosin needles and sheaves which have crystallized out. We are informed by Dr. Maclean that the amount of this amino-acid normally present in the duodenum is not likely to represent a greater concentration than we have

used in our tubes. From our observations we do not consider that a division into four amoebulae takes place, as a rule, within the cyst. After the Entamoeba has completely emerged, the cyst-membrane left behind appears like a very delicate, single-contoured, usually spherical ring (Fig. 7); only by careful focussing at a particular level can the break in the wall be made out, which represents the dissolved area (Fig. 8).

We have seen excystation of amoebae which had no chromidial block in the protoplasm (Fig. 6), as well as of others which possessed this structure (Fig. 8); so that one of these conditions cannot be said, apparently, to represent a riper phase, as regards readiness for excystation, than the other. For a little while the liberated Entamoeba remains more or less rounded and sluggish; but soon it begins to throw out the typical clear, blunt pseudopodia of the *histolytica* type, these often welling out laterally in the characteristic manner. We have not yet been able to carry out direct observations further at this period, and cannot say, therefore, whether the Entamoeba proceeds to divide into four, and, if so, how soon this occurs. Indeed, from our living observations, we could not tell whether the amoebae which excysted had always four nuclei, or whether individuals with only one or two nuclei also had been able to excyst.

When we have ascertained that excystation was proceeding actively in the tubes, we have always subcultured from them into the expression-liquid of blood-agar tubes, to which either two parts of citrated blood or equal parts of citrated blood and fresh serum were added. These new tubes were then placed in a vacuum and incubated at 37° C. At from eighteen to twenty hours after the excystation period we have seen both small and moderate-sized active *histolytica* forms in these cultures, a few of the larger individuals containing red blood cells. It is a moot point whether any multiplication had occurred, beyond probably division of some of the originally encysted forms into four; and even in regard to this we do not feel certain. In spite of all our efforts so far, the growth of bacteria has always been excessive and gave no promise of successful cultivation of the Entamoebae. On one or two occasions, twenty-four hours later—that is to say, from forty-two to forty-four hours after excystation—we have found one or two amoebae still alive but moribund.

To our surprise, the above method, which has proved so successful for the excystation of *E. histolytica*, has entirely failed to produce excystation of *E. coli*, and by none of the other methods tried have we been able to induce this form to excyst. We have evidence, however, that the small "*minuta*" form, which we have recently described,[1] excysts in the same manner as *histolytica* (*tetragena*), using the same method; and this bears out our view as to the close relationship of these two forms.

In the case of *Lamblia*, also, we have been unable to induce excystation. From the appearances of the cyst contents which we have observed, we are strongly of opinion that only a single individual will be liberated and not two separate individuals. In other words, we consider, as we have previously stated,[2] that conjugation and not division occurs within the *Lamblia* cyst. Wenyon[3] has expressed the view that these cysts are multiplicative, and represent, indeed, the endogenous form of multiplication shown by these parasites within the host. In our opinion this view is mistaken, and does not take into account the biological factors (environmental conditions) which influence both encystment and excystation (Cropper and Drew,[4] Woodcock and Lapage[5]). Not to enter into details here, we will only point out that when permanent (resistant) cysts, such as are passed out with the faeces, are formed in the bowel, conditions other than those prevailing in the region where encystment is occurring are necessary for excystation and the commencement of a fresh cycle of activity. Equally as is the case with the cysts of the parasitic Entamoebae, for instance, we have little doubt that these *Lamblia* cysts only undergo excystation on passing down the alimentary tract of a fresh host and coming into contact with its digestive juices. From our experience of multiplication in flagellates we should say the process takes place very rapidly; and it is quite likely that it occurs mainly amongst those parasites which are attached to the epithelium.

Had time permitted we had intended to use the above described method of inducing excystation of the cysts of *E. histolytica* to test the vitality, and consequently the infective power, of the cysts, when kept under different conditions for varying lengths of time; much more evidence is needed in regard to this point on account of its great hygienic and sanitary importance. The chief experiment which we have had opportunity to carry out, so far, in this direction has been to keep cysts in a very slowly running current of water for fifteen days and to ascertain that certainly some were still alive at the end of this period. By this time the débris was practically freed from faecal bacteria, apart from those normally occurring in the water, and free-living protozoa (ciliates and flagellates) were present. We should say, therefore, that water which has been contaminated with cyst-containing faeces may remain a source of infection for a considerable period.

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AMOEBIC DYSENTERY IN A MAN WHO HAD NEVER LEFT ENGLAND.

BY

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AMOEBIC DYSENTERY occurring in the British Isles is remarkably rare. Most of the cases hitherto recorded have been conditions of intestinal ulceration associated with liver abscess which have only been diagnosed *post mortem*. Thus Dickinson,[1] in 1862, described the occurrence of a hepatic abscess of considerable size with ulceration of the large intestine in a woman who had never been out of England. In 1881 Dickinson[2] again recorded a second case, that of a man aged 36, who also had never left England. *Post mortem*, ulceration of the large intestine was found coexisting with a liver abscess. In the same year Moore[3] described a further case, that of a child aged 3½, who died with two hepatic abscesses and extensive ulceration of the large bowel. She had never been out of London. Amoebae are not mentioned in connexion with any of these cases, though the organism is said to have been discovered by Lambl as early as 1859, subsequently being more fully described under the name *Amoeba dysenteriae* by Lösch in 1875.

Saundby and Miller,[4] however, in 1909 recorded the case of a man aged 42, in whom, *post mortem*, were found extensive ulceration of the large intestine and a liver abscess. Amoebae were demonstrated both in the intestinal ulcers and in the abscess cavity.

In none of these cases was the diagnosis made until after death, and it remained for Marshall,[5] in 1912, to report the first case occurring in the British Isles which was diagnosed during life. This was a man who had never left Scotland, and in whose stools amoebae were repeatedly demonstrated; he made a good recovery. An ex-soldier, living near this patient, had spent some time in India, but gave no history of dysentery. Amoebae were not found in this man's faeces, and feeding experiments on a cat gave negative results.

Our patient was a private, who enlisted at the beginning of 1915. Prior to enlistment he had always lived in or about Manchester. The great majority of the men in his unit had been abroad at some time, but none had been out of England during the present war. Of three men who were sleeping in the same room as the patient only one had been abroad. This man had served in the South African war, where he had had diarrhoea of three days' duration only, which never recurred. His faeces, as well as those of five others in the unit, including the cook, who were said to have had dysentery abroad some years ago, were examined, with negative results. One, however, showed encysted forms of *Entamoeba coli*.

The patient, rather a stout man, aged 39, but looking considerably older, was admitted to hospital on February 16th, 1916. He had had no previous illness up till the onset of his present

complaint. Ten days before admission he complained of slight abdominal pain which increased in severity. Diarrhoea did not commence until four days later; from that time the number of motions varied from six to twelve per day, and were associated with some degree of tenesmus. It was not until the fourth day of diarrhoea (two days before admission) that he noticed "blackish blood" in the stools, and from this time onwards they continued to be blood-stained with an average of about twelve in the twenty-four hours.

On admission the temperature was 99° F., and the pulse 80. The tongue was furred, the teeth discoloured and carious, and he complained of pain across the lower part of the abdomen. There was marked tenderness in the left iliac region, and also to the right of the umbilicus, but no rigidity of the abdominal wall. The liver and spleen were not enlarged, and nothing was felt on rectal examination. The faeces were dark in colour, and contained mucus and dark red blood. A microscopical examination of the motion the following day revealed the presence of a large number of *Entamoeba histolytica*.

On the patient's fourth day in hospital emetine treatment was commenced. One grain of emetine hydrochloride was given by hypodermic injection daily for fourteen days (one-third of a grain in the morning and two-thirds of a grain at night).

During the first three days after admission the number of motions averaged twelve in the twenty-four hours; they were quite loose, and contained a quantity of blood and mucus. After six days of emetine treatment the number of motions had fallen from twelve to four in the twenty-four hours; they were still loose, and contained mucus but much less blood. Three days later the motions had diminished to three a day; they were loose, but there was only a small quantity of blood, and the patient was feeling much better. On the twelfth day with emetine the motions, though still inclined to be loose, were free from blood, and for the first time amoebae were absent. On the last day emetine was given the patient had but one motion, semi-solid, with a little mucus but no blood. Five days later the motion was fully formed, and mucus and blood were absent. From this date the patient progressed favourably without further incident.

The faeces were frequently examined throughout the illness, and active forms of *Entamoeba histolytica* were found up till the tenth day of treatment with emetine, but at no time afterwards. No cystic forms of the parasite were ever seen, although the motions were examined until three weeks after the patient's recovery, and no bacilli of the typhoid-dysentery group were isolated.

The blood tested as regards agglutinating power against the dysenteric organisms "Shiga," "Flexner," and "Y" types, proved negative.

The tongue, which was furred from the beginning, continued so until about the seventh day with emetine injections, when it began to clear. It was quite clean when they were stopped. The liver was frequently examined, but at no time was any enlargement noted. Abdominal pain persisted with diminishing severity until, practically, the motions were fully formed. During the first ten days in hospital he frequently complained of considerable pain after defaecation. The tenderness to the right of the umbilicus, mentioned on admission, had quite disappeared by the ninth day of emetine treatment, while that in the left iliac region did not disappear until three days after the motions were quite normal.

As regards temperature, at no time was it above 99.4°, which point it frequently reached during the first ten days after admission, but from this time onwards it was normal.

Although we failed to find pathogenic amoebae or their cysts in the faeces of those men examined, it is possible that the carrier was among other men in the unit who had been transferred to duties elsewhere before the patient came under observation.

The case we have recorded, therefore, appears only to be the second reported as occurring in Britain in which amoebic dysentery was diagnosed as a primary condition, and during life.

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SIXTEEN cases of plague have been notified in Hong Kong since January 1st.

THE *Boston Medical and Surgical Journal* states that it has been computed that there are now more than two hundred open-air schools and classes for tuberculous and anaemic children in the United States. Massachusetts heads the list with 86, of which 80 are in Boston; next come New York with 29 and Ohio with 21. The first school of this kind was opened in 1907, and in 1910 there were only thirteen at work. It is estimated that there should be in cities one open-air school for every 25,000 of population.

THE TREATMENT OF PUERPERAL SEPSIS BY UTERINE SUCTION AND DRAINAGE.

BY

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THE suction tube has all the advantages with none of the dangers of the uterine douche. In at least two cases I have seen the uterine douche convert a smart sapraemia into a rapidly fatal general infection, whilst in another case it set up acute, presumably chemical, peritonitis. Whilst I was administering the douche the woman was seized with agonizing abdominal pain, which was quickly followed by general collapse and rapidly developing abdominal tenderness and distension. The douching was at once stopped, but the patient died five hours after the onset of the acute pain.

Dr. Goodall[1] has collected sixteen examples of chemical peritonitis following intrauterine douches. He says:

> My eyes have been opened recently to the great ease with which fluid can be forced from the uterine cavity into the peritoneum. This was first brought to my notice by the frequency with which watery fluid was found in the peritoneal cavity after curettage. In not a few cases I have been astounded at the amount, and have examined the uterus for evidence of puncture, but this was never found. But the condition was readily explained when, later, Dr. Chapman began to inject a strong solution of iodine into the uterus in carcinoma cases in order to kill out the malignant cells and prevent their contaminating the field of operation. It was then found that, though a minimum of force was used, invariably the pelvic peritoneum was deeply stained, and contained fluid iodine in variable quantity.

To illustrate the patulousness of the Fallopian tubes Dr. Goodall narrates a case of congenital atresia of the sigmoid. The abdomen was markedly distended, and dark liquid blood was coming in spurts from the vagina. On operating, the abdomen was found full of blood and meconium, the sigmoid having ruptured. At the autopsy, four hours later, blood was still coming from the vagina.

In the cadaver Dr. Goodall has injected methylene blue into the uterine cavity with douche-can and cannula, imitating as closely as possible the technique of operative work. With a pressure of only two feet of elevation, and in some cases only eighteen inches, and with a temporary obstruction to the outflow, such as is frequently caused by clots and fragments of tissue, he was able to send fluid into the peritoneal cavity through the Fallopian tubes. Hence, he says, the risk of chemical peritonitis, not to speak of septic peritoneal contamination.

Then it should be possible to remove retained decidua from the uterus by means of the suction tube, and obviate the need for the deadly curette and the dangerous digital exploration of the uterus. The method of treatment is illustrated in the following cases:

CASE I.

On August 4th, 1914, I was asked to see a primipara, aged 25 years, who nine days before had been attended by a qualified midwife, who is also a trained hospital nurse. The labour was normal, and the placenta came away intact in about twenty minutes. When I saw the patient she had a temperature of 103.5° and a pulse of 140. The lochia had been and were normal and odourless, but the large uterus was retroverted. The uterus was reduced and a saline ordered. Next day, after vaginal douching, a gauze drain was put into the uterus, and renewed daily. For three days the temperature hovered round 103°, the patient was apathetic, semidelirious, had intense headache, there was some abdominal distension, and the lochia became fetid. On the thirteenth day after delivery a glass Budin's catheter, to which the inlet end of a Higginson's enema syringe was attached, was passed into the uterus. To secure the syringe to the Budin's catheter the inlet valve was removed. The tube of the syringe between the bulb and the catheter was held firmly and the bulb squeezed, so as to drive out the contained air through the nozzle. On releasing the pressure on the bulb, the valve behind the nozzle closed and prevented the return of the air. There was then a vacuum in the syringe, and on releasing the pressure on the tube, between the bulb and the Budin's catheter, suction was exerted through the catheter within the uterus. No air was drawn into the uterus, although the suction drew into the orifices of the catheter thick, grumous, semipurulent masses, which were too big to pass through, and, when the catheter was withdrawn, came with it. Reintroduction of the catheter and suction drew out more of these thick pieces. The vagina was syringed, and a gauze drain was inserted into the uterus. The next day the patient was free from headache, and the temperature had fallen to 100.8°. The fetor of the discharge was less, though the labia were swollen and red, and an abscess with no well-

defined limits formed over the sacrum. This was incised later. Suction was applied to the uterus on two successive days, after which the temperature did not rise above 99°, and the patient made a good recovery.

CASE II.

I was called to a primipara, aged 21, on January 6th, 1915. Just before my arrival she had given birth to a dead, decomposing six or seven months child. The placenta came away intact whilst I was separating the child. No vaginal examination was made. The same night the temperature was 99.4°, the next night 101.2°, and on the following morning 103°, with a pulse of 140. The vagina was douched night and morning, and Budin's catheter passed into the uterus. On suction by means of the Higginson syringe thick débris filled the tube and was brought away, after which a gauze drain was left in the uterus; 3 grains of calomel were given. The temperature at night was 100.8° F., pulse 120. There was no abdominal distension. The lochia were most offensive, and the smell was intensified when the gauze drain was taken out of the uterus. The suction tube was passed daily, and a gauze drain left in the uterus. On January 13th there was some odourless discharge on the diaper, and the smell in the room was only just perceptible. As soon, however, as the catheter was passed into the uterus it filled with thick, dirty, bloody liquid, smelling most offensively. About an ounce and a half of this offensive material, together with a quantity of blood clot, were sucked out of the uterus. On the next day, although there was only a little almost odourless discharge on the diaper, a quantity of thick fetid red liquid was evacuated from the uterus.

On the next day there was a similar experience. Though the diaper was covered with more discharge, free from offensive smell, thick, foul-smelling liquid was obtained from the uterus. The temperature, which for the last six days had not been above 101° at night, now reached 102°; the pulse was 120. As there was evidently imperfect drainage from the uterus, a piece 3 in. long was cut from the end of a large size celluloid Budin's catheter, and, held in a pair of forceps, was passed into the uterus. A string was attached to the piece of catheter for withdrawal, and the tube was retained in the uterus by a gauze vaginal plug. The tube was removed, sterilized, and reinserted daily. In two days the temperature fell to normal, and as it was normal on the following day, and only a small quantity of odourless, glairy mucus was obtained on suction of the uterus, a gauze wick was substituted for the celluloid drain. The next day the temperature rose to 100°, and as some thick, grumous liquid, very like thick pus, together with mucus and blood came away, the celluloid tube was reinserted into the uterus. The same night the temperature dropped to normal, and, next day, though nothing could be sucked out of the uterus, the gauze in the vagina, as well as the diaper, were soaked with discharge. Evidently the uterus was draining well. The temperature remained normal for three days after the reinsertion of the tube, and it was then removed and no drain of any kind was put into the uterus. The same night the temperature rose to 102°, and the patient had a rigor. It was found impossible to insert the celluloid tube into the uterus, which was acutely anteflexed, but the next day after softening the tube in hot water and bending it, it was inserted without difficulty. It remained in the uterus forty-eight hours, when it was finally removed, and as tender periuterine thickening became perceptible, and as it was impossible for the girl to remain longer where she was, she was removed to the Liverpool Hospital for Women. The periuterine swelling subsided satisfactorily, and the patient left the hospital in nine days.

I was not aware when I drained this girl's uterus, by placing a tube within it, that the same thing had been done before. Mr. H. Milton[2] has drained the puerperal uterus, keeping the tube in the uterus six, ten, and fourteen days; whilst Dr. Ernest Gallant,[3] of New York, has reported 252 cases of continuous uterine drainage in non-puerperal cases. The tubes were worn in the uterus without removal for so long as five, six, and seven months. The results of Mr. Milton and Dr. Gallant suggest that I need not have removed the tube from my patient's uterus so soon after the temperature fell.

The following is another case in which similar principles were adopted:

CASE III.

Mrs. E., aged 30. The child was born just before I arrived at the house, and the placenta was easily expelled intact in about four minutes. No vaginal examination was made, but three stitches were put into the perineum. In an adjoining room the patient's father was dying from an ulcerating epithelioma of the lips, face, and mouth. The stench from it filled the whole house. The day after the child was born the mother's temperature was 99.6°, on the second day 103°, after which it fell to 100°. The lochia became very offensive, the smell resembling closely that from the father's room. Till the seventh day vaginal douching night and morning was used, and then, as the temperature remained above 100°, Budin's catheter was passed, and a small quantity of offensive brown liquid was withdrawn on using suction. A gauze drain was passed into the uterus. The next day, on inserting the tube into the uterus, it filled at once with thick brown liquid, less offensive than before. The suction tube was used daily, and each day the fluid removed became less offensive, less opaque and thick, until, at the end of five days, just a small quantity of clear, odourless, blood-stained fluid, free from shreds and semi-solid matter, was sucked out. After this the only local measure used was a vaginal douche night and morning. The condition of the patient, however, became more grave, though Dr. Wille t of Liverpool, who kindly saw the patient with me, agreed that there was then nothing abnormal in or around the uterus. The clinical picture—profound anaemia, intractable vomiting, lethargy, intermittent abdominal distension and visible peristalsis, pigmentation of the breasts, legs, and abdomen—suggested Addison's disease. On the twenty-fourth day after delivery the patient died.

This case was one of true septicaemia, apparently, producing fatal blood destruction. The woman's father, whom I look upon as the source of the infection, died ten days after the birth of the child. I regret now that I did not give the woman antistreptococcic serum at the outset. But the first symptoms were not severe, and my experience of serum treatment in puerperal cases has been most disappointing.

Uterine suction tells us the conditions in the interior of the uterus. It is most instructive to watch the gradual alteration of the stuff withdrawn from a thick, offensive fluid, loaded with semi-solid purulent masses, to a clear red liquid, and from that to an inoffensive mucus. Moreover, it prevents us from being misled, as we doubtless often are, by the deceptive character of what we find upon the diaper. The diaper may be covered with discharge, which may be only an overflow, or may not come from the penthouse in the uterus at all, for there may be odourless discharge on the diaper, and foul, fetid fluid in the uterus. And efficient drainage of the uterus is the key to the successful treatment of puerperal sepsis.

The holes in the uterine end of the ordinary Budin's catheter are too small, and Messrs. Down Bros. have made to my instructions a larger model, which will allow the passage of uterine débris into the catheter. They have also made for me a grooved celluloid drain for intra-uterine use, when the use of a drainage tube is indicated. Syringes other than the Higginson could be used to exhaust the suction tube, so long as they do not pump air into the uterus.

My cases are not numerous enough to dogmatize upon, but as now my opportunities for seeing such cases are limited I venture to publish them.

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A NOTE ON THE USE OF THE GALVANOMETER AS AN AID TO THE DIAGNOSIS OF NERVE LESIONS.

BY C. NEPEAN LONGRIDGE, M.D.VICT., F.R.C.S.ENG., M.R.C.P.LOND.

SOME two years ago an article appeared in a medical periodical dealing with the electric currents which could be detected in the human body with the aid of a sensitive galvanometer. From the results obtained it was surmised that the brain is the seat of generation of an electro-motive force which is carried to the tissues by means of the nerves. Being sufficiently interested I put myself into communication with the author of the paper, and found that Mr. A. E. Baines, a submarine cable electrician, was the author of the theory. After some correspondence and interviews with this gentleman I obtained and set up an extremely sensitive astatic galvanometer of the Kelvin type. The instrument I am using has a resistance of 99,000 ohms.

Recently I have had an opportunity of examining two cases which, to my mind, constitute definite proof of the main truth of the theory. The examinations were made in a room at least half a mile away from the tram lines in the town which carry a continuous current of 500 volts, and in all cases the precaution was taken of earthing the patient before the readings were made. The method used was to fix a circular silver plate about an inch in diameter in the exact centre of the forehead; this plate

was connected to one pole of the galvanometer. The second pole was connected to a small silver button 2 mm. in diameter mounted in a vulcanite handle which could be brought into contact with any part it might be desired to test. With both poles in contact with the patient's body and the circuit key closed a deflection was obtained on the galvanometer scale which could be read off in millimetres.

The first case was that of a soldier under my care in the Racecourse Hospital, Cheltenham, with a wound just below the centre of the left forearm, and definite symptoms of paralysis of the median nerve below the seat of the injury. The wound had been inflicted several weeks before I saw him, and had healed.

On examination with the galvanometer the following deflections were obtained on the dates indicated, the moving contact being pressed upon the pulp of the fingers:

Galvanometric Deflections Obtained in Two Cases of Injury to Nerves.

	Case I.—Wound of Median Nerve.				Case II.—Wound of Ulnar Nerve.
	First Examination.	Feb. 21st.	March 15th.	April 1st.	April 1st.
Thumb ...	20 mm.	0 mm.	0 mm.	5 mm.	320 mm.
First finger ...	0 mm.	0 mm.	0 mm.	55 mm.	Off scale deflection.
Second finger	0 mm.	0 mm.	6 mm.	120 mm.	Do.
Third finger ...	75 mm.	90 mm.	130 mm.	Rapid off scale deflection	Do.
Radial side...	5 mm.	7 mm.	5 mm.	100 mm.	Do.
Ulnar side ...	155 mm.	140 mm.	150 mm.	Rapid off scale deflection	3 mm.
Fourth finger	120 mm.	150 mm.	135 mm.	Do.	5 mm.
Hypothenar eminence	—	—	—	—	0 mm.
Thenar eminence	—	—	—	—	Off scale.

On February 18th, a few days after the first examination, I dissected out the median nerve, which was embedded for 1½ in. in dense scar tissue, and was partially divided on the ulnar side. After freeing the nerve from the scar tissue I resected three-quarters of an inch of it which was densely fibrosed, and joined the ends by catgut sutures. At the suggestion of Dr. Affleck, who was assisting me at the operation, I wrapped a piece of vitelline membrane from an egg round the seat of the suture. The wound healed moderately well, with the exception of a small area in the centre where the incision went through the old scar.

On April 1st the deflections obtained were better. On this occasion the man had walked a distance of two miles to the testing room, whereas on previous occasions he had been brought in a motor. The warmth of the day and the exercise perhaps accounted for the higher readings on this occasion.

In this case I have for the sake of simplicity only mentioned the finger deflections, although others were taken which were in consonance with the results obtained above.

On April 1st I was fortunate in being able to examine a man (Case II) with a healed wound just above the internal condyle of the left humerus, which was thought to have resulted in division of the ulnar nerve. The deflections in this case were the exact complement of the previous one.

These two cases to my mind demonstrate that something—it may be electricity or it may be something else—which acts upon a galvanometer in the same manner that electricity does is conducted by the nerves. The first case also shows that anatomical continuity of a nerve does not imply also its vital conductivity, since three days after complete section and restoration of its anatomical continuity it was not conducting any current which could be demonstrated by the galvanometer. I might mention that no deflection is obtained as a rule from scar tissue which is generally devoid of nerve fibrils.

In this short communication I do not wish to go into any of the wider applications of the galvanometer as an aid to diagnosis but simply to establish the fact that the nerves obviously do conduct electricity or a "trophic influence," which is at present indistinguishable from it.

A SIMPLE PORTABLE REFRIGERATING BOX AND ITS USE AS A TEMPORARY INCUBATOR IN MILITARY WORK.

By S. DELÉPINE,

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Last autumn a large number of soldiers who had returned from the Near East were admitted to several of the hospitals forming part of the 2nd Western Military Hospital. Most of these men were reported as convalescing from dysentery, typhoid fever, and paratyphoid fever. The excreta of all these cases had to be examined repeatedly before the men could be discharged from hospital.

At first these examinations were conducted at the Public Health Laboratory by Captain Sellers and Captain Loveday, but during the month of December the temporary services of three other bacteriologists became available.

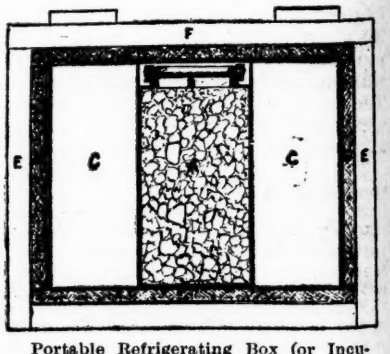
With regard to the typhoid cases, it would have been possible by an extension of the usual laboratory arrangements to examine daily a large number of cases, but as the faeces of the soldiers returning from the East had to be tested not only for the presence of typhoid, paratyphoid, and dysentery bacilli, but also for amoebae, it was desirable that the material should be examined while the stools were still warm, as this made the detection of motile protozoa easier and more rapid and certain.

It was, however, impossible to make arrangements to examine daily, immediately after evacuation, the stools of some 100 or 150 men, and it became necessary to devise means of collecting the material and keeping it warm for some time until the bacteriologist could conduct his examination.

It occurred to me that the portable refrigerators which are regularly used in the laboratory for the forwarding of samples of water, milk, and other products, would meet our requirements if used as warm chambers. These chambers allowed room for from thirty to sixty of the special tubes I have designed for the collection of samples of faeces for bacteriological purposes (see below). It seemed probable that the use of these temporary warm chambers would render the examination of a large number of specimens under suitable conditions not only possible but also convenient, and the experience gained in five months, during which more than 10,000 examinations of dysenteric faeces were made, has confirmed my expectations.

Description of the Portable Refrigerator.

The present form of the refrigerating box is a modification of a somewhat better but more fragile portable refrigerator, designed by me in 1892, and still in use both in my laboratory and elsewhere. The original box is a double-walled zinc chamber resembling a small incubator. The proportionally large cavity between the walls is filled with ice through a large lateral bunghole. The chief fault of this box is that its unsupported, comparatively thin walls suffer when the box is thrown about, as frequently occurs during railway transit. My new refrigerating box, which I have used for some years, is nearly as efficient as the first, and has great powers of resistance. It consists of a central or lateral metal ice recipient, hermetically closed by means of a large screw bung. Round the ice-box a number of compartments are formed by metal partitions continuous with the walls of the refrigerating box. Each one of these compartments is



Portable Refrigerating Box (or Incubator).—The size of the box is 12 in. by 9½ in. by 8½ in. A, Recipient for ice or for warm water; B, screw bung for ditto; C, compartments for objects to be kept cool or warm; D, felt covering; E, wooden box; F, lid.

a tube of the same length as the refrigerating box. The bottom of these tubes may be closed by a metal plate or left open. Externally the refrigerating box and the system of compartments attached to it have the form of a cylinder, cube, or parallelepiped, as may be found most convenient. This part of the apparatus may be made of any metal, but on account of weight zinc and aluminium are the most suitable.

This metallic part of the apparatus is enclosed in a wooden box lined internally with a layer of loose felt $\frac{1}{8}$ in. to $\frac{3}{4}$ in. thick. To secure efficiency *this felt should be quite dry*, and to prevent any wetting taking place when the ice-box is filled, the opening of the box is at the bottom of a shallow tray, which must be mopped quite dry each time the box is filled. The felt may also be enclosed between layers of waterproof material. The capacity of the ice-box is 1,800 c.cm., and 1,000 grams of broken ice can easily be packed into it.

If in a room at 22° C. a bottle containing 250 c.cm. of water or milk at 15° C. is placed in one of the compartments of the refrigerator, and the wooden box is properly closed, the temperature of the water falls to 8° C. in one hour, to 4° C. in two hours, to about 2° C. in three hours, 1° C. in four hours, and remains below 2° C. for twelve hours more; it then rises gradually to 9° C. in another twelve hours. For at least eighteen hours the temperature of the water or milk remains below 4° C., and is sufficiently low to inhibit the growth of most bacteria.

In the case of water or milk at 36° C. the temperature is brought to about 8° C. in three hours, to below 4° C. in six hours, and continues to fall up to the fourteenth hour, after which it begins to rise slowly, but keeps below 4° C. for another ten hours.

No material multiplication of bacteria is observed in the course of twenty-four hours in a bottle of cow's milk placed in one of these refrigerators immediately after milking.

Peptone bouillon inoculated with a loopful of a culture of *Bacillus enteritidis* taken as an example of a very quickly growing organism, remains quite clear for over twenty-four hours when placed in a portable refrigerator; the same quantity of bouillon inoculated with the same amount of culture kept in a living-room at 18° C. is quite turbid after the same interval of time. In an incubator at 37° to 40° C. the growth of the bacillus renders the bouillon turbid in about four to five hours.

By removing daily the melted ice water and replacing it by fresh ice it is possible to keep the contents of the refrigerating box at a suitable temperature for several days when a large refrigerator is not available.

Description of Portable Temporary Warm Chamber or Incubator.

If the stoppered receptacle of the apparatus just described is filled with hot water or other material at a suitable temperature, capable of liberating heat gradually, a convenient form of temporary portable incubator is obtained. It is true that the temperature of products placed in this apparatus falls gradually and constantly, but this cooling takes place slowly, as is shown by the following observations.

The incubator being in a room at a temperature at 15° C., the stoppered receptacle was filled with water at 48° C. and a bottle containing 250 c.cm. of water at 34° C. was placed in one of the compartments of the apparatus. After two hours the temperature of the water in the bottle was 35° C.; after three hours it had returned to 34° C.; after six hours it was 30° C., and was still 20° C. fourteen to fifteen hours after the beginning of the experiment.

In another experiment, the temperature of the room being 15° C. and that of the water in the recipient 48° C., the cooling of 250 c.cm. of water placed in the incubator took place as follows:

The Original Temperature of the Water in the Bottle placed in one of the Compartments of the Incubator was slightly over 37° C.

After	1 hour	the temperature	was about	...	37.0°
,,	2 hours	,,	,,	...	36.7°
,,	3 ,,	,,	,,	...	35.0°
,,	4 ,,	,,	,,	...	33.3°
,,	5 ,,	,,	,,	...	31.2°
,,	6 ,,	,,	slightly below		30.0°
,,	14 ,,	,,	over	...	20.0°
,,	20 ,,	,,	...	...	17.0°

At the end of 14 hours the temperature was still 5° above that of the air outside the apparatus refrigerator.

By filling the recipient with water at 55° to 60° C. a suitable range of temperatures, extending over a longer period, is obtained.

Practical tests gave results in accordance with the above findings. Peptone bouillon inoculated with one loopful of *Bacillus enteritidis* and placed in the portable incubator at 34° C. was nearly as turbid in five hours as a similar amount of bouillon inoculated with the same amount of *Bacillus enteritidis* and incubated at 36° C. in an ordinary incubator was found to be after the same interval of time.

After twenty-four hours the growth of the culture in the portable incubator had considerably increased, but, as could be expected, was somewhat less abundant than that of the culture kept during the same period at a constant temperature of 36° C.

With regard to intestinal protozoa, they remained motile in faeces contained in collecting tubes placed in the portable incubator while the stools were still warm—that is, for several hours.

The apparatus which I have devised for the collection of faeces consists of a deep round glass spoon a little over $\frac{3}{8}$ in. in diameter, provided with a long handle about 6 in. in length. This spoon is kept in a stout test tube, well closed with a cork through which the handle of the spoon passes. By means of this apparatus it is possible to take, with a minimum amount of inconvenience, suitable samples of the stools which have been passed into sterilized vessels provided for the purpose.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

CANCRUM ORIS TREATED BY GALYL.

A GIRL, aged 3 years, was admitted to the Ham Green Isolation Hospital on February 4th suffering from measles and bronchopneumonia. She was a feeble, ill-nourished child. There was a considerable amount of stomatitis, and the upper incisors were much decayed. On February 22nd the right upper central incisor dropped out, leaving a necrotic socket. By the next day, in association with extremely rapid sloughing of the mucous membrane on the premaxilla, two more of the incisors came away. A sloughing ulcer was also forming on the buccal surface of the upper lip opposite the upper incisors. On February 24th the condition was as follows: The whole of the premaxilla was devoid of mucous membrane and obviously dead. The mucous membrane reflected on to the buccal surface of the upper lip was destroyed for an area about the size of a shilling continuous with the necrotic surface on the premaxilla, and a deep hole was punched out of the lip though not perforating it. The fetor was extreme. The temperature from the beginning of the illness was swinging up to about 101° F.

Under chloroform Major Robert Lansdowne removed the whole of the dead bone, including the last incisor and both canines, and the corresponding embryonic teeth.

Next day, as the destructive process was extending rapidly, 6 cg. of galyl were injected intravenously without producing any toxic symptoms. Within forty-eight hours a line of demarcation formed between the living and dead tissues. By February 29th granulations were growing up through the sloughing areas, and the fetor was much less marked.

The improvement was maintained until about March 17th, when the granulations and line of demarcation began to disappear. By March 19th the destructive process was obviously again extending rapidly. Another dose of 6 cg. of galyl was given intramuscularly, as the previous intravenous injection was found very difficult in a child of this age. On March 21st a clear line of demarcation had again formed, and from this date the cavity began to heal rapidly; some small pieces of dead bone separated. The intramuscular injection caused some localized tenderness, but no pain or swelling.

On April 12th the right upper molar, which was loose, was removed. By this date the child's general condition was greatly improved, and the mouth nearly healed. She was discharged on April 25th, with the mouth completely healed and the deep cavity covered by healthy mucous membrane. Her general condition improved to a remarkable extent during the last four weeks in hospital, and she became fat and well.

The fact that rapid improvement occurred after each

dose of the galyl seems to show that it was due to that drug. Eusol was used locally to the mouth throughout the whole course of the illness. It is, perhaps, pertinent to remark that the child had had no mercury or other drugs which might cause this condition during any part of her treatment.

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THE USE OF SOME SIMPLE THINGS IN SURGERY.

I FOUND the following useful:

1. "*Cements*" *for the removal of foreign bodies* from urethra—chiefly stone. Pass a full-sized endoscopic tube with round, not oblique, end, down to body and fix latter by finger behind it from the outside. Remove moisture by cotton-wool. Melt some "elastic glue" and dip the pen end of a pen-handle therein; quickly pass this down the tube and retain in contact with the body for some time. Withdraw tube and pen-handle together. In the only case I tried this it was successful. Cold externally would make the "cement" set better, and perhaps other things (pitch, etc.) might stick firmer still. Forceps nearly always tear the mucous membrane. The same device might be used for the ear.

2. *A condom* tied over a catheter, lubricated, passed and inflated, is useful for urethral or prostatic haemorrhage. Perhaps likewise for epistaxis.

3. *A wine or whisky bottle* containing hot water, and *kept pressed* to the perineum for some hours, the night of the day an instrument is passed, very materially aids the absorption of stricture, and is much more striking than fibrolysin; containing cold water it is the best means of subduing the erethism of inflammation. It is efficient in pruritus ani.

4. *An elastic bandage* applied at proper time after a hydrocele is injected (iodine and carbolic acid), by keeping the layers of tunica vaginalis in apposition, will often lead to radical cure.

5. Tinct. iodi painted on the hands, over this tinct. benzoin. co., and over this iodine again, is no mean substitute for gloves.

6. *Extemporary specula, etc.* The handles of two toothbrushes are an excellent anal speculum; the loop ends of hairpins bent at right angles, good nasal. Two teaspoons bent back 1½ in. from bowls make a bladder speculum. Dinner forks bent forward at prongs are the best wound retractors.

7. *The end of a scalpel handle* flattened more, rounded off, and serrated forms a much needed dissector (separating bladder, etc., from adhesions).

8. *Any thick-walled small rubber tube* cut very obliquely at one end, the edge of the ellipse being smoothed off by a heated knife blade, constitutes, when well lubricated, a capital catheter.

9. *A whalebone stylet* bent into coudée shape in hot water, and passed into this or into any rubber catheter, makes the best coudée catheter.

10. *Bristle and wire pipe cleaners*, pulled to and fro through catheters, are the best cleaners of their lumens.

11. *A tuning-fork* is useful in the diagnosis of fracture.

12. *The air balloon of a small football* under a T bandage and inflated by a cycle pump makes the most efficient perineal pressure, and above the pubis the best uterine. A child's stout air balloon makes a Petersen's bag.

13. *A strip of lint* tied round the root of the penis and embracing the scrotum behind the testes is the handiest contrivance to which to attach the threads of a retained catheter.

14. *The hair of women* in scalp wounds, after disinfection of the parts by iodine, can be used as sutures by tying bundles of the hairs together. As far back as my student days I used this (and with no more sepsis than with ordinary modes) in Dublin, a city then distinguished for its lacerated scalps.

15. A stout stick under the bent knees, the ends connected to the top of the operating table by two bandages, does for a Clover's crutch.

Finsbury Pavement, E.C. JAMES MACMUNN.

BY decree dated February 24th, 1916, the Italian Government gave official recognition to the national workshop for the manufacture of artificial limbs and other prosthetic apparatus for wounded soldiers established at Milan.

Reports of Societies.

ANNUAL CONGRESS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

(Continued from p. 692.)

Discussion on Foreign Bodies in the Eye and Orbit, with Special Reference to Prognosis and Treatment.

THIS discussion was opened by Mr. A. L. WHITEHEAD and Mr. HERBERT PARSONS. Mr. Whitehead insisted, in the first place, upon early diagnosis, accurate localization, and early treatment. He pointed out that the great majority of bodies likely to enter the eyeball were opaque to *x* rays, but that glass (unless of the heavy lead variety), small pieces of aluminium or flint might be missed. He described the giant magnet he was in the habit of using, its great advantage being that it was very mobile and adjustable, and so was easily brought up to the patient's eye. For removal of bodies from the vitreous chamber Mr. Whitehead advocated incision of the sclera as near as possible to the foreign body and extraction by this route, rather than drawing it forward into the anterior chamber and removing it through a corneal incision.

Mr. PARSONS spoke of the need for more accurate knowledge of the anatomical relations of the eye to the orbit. He stated that fragments of copper might cause suppuration even in the absence of all pyogenic organisms, and discussed the chemistry of siderosis bulbi. Fine pigmentary changes at the yellow spot might follow perforation of the eyeball, irrespective of actual injury to this region (a case in which this had occurred was exhibited by the PRESIDENT). Mr. Parsons stated that he did not think that mere retention of a sterile foreign body, whatever its nature, was of any importance at all, so far as sympathetic ophthalmitis was concerned.

Many members took part in the discussion which followed.

Discussion on the Treatment of Syphilitic Eye Affections by the Newer Methods.

Mr. LAWFORD, having surveyed the gradual development of the organic arsenic compounds, expressed doubt as to their value in the later manifestations of syphilis such as cycloplegia, mydriasis, miosis, and loss of light reflex. He did not think they should be used in cases of primary optic atrophy. In cases of interstitial keratitis he believed the general opinion was that these compounds had no striking effect, and would not prevent the second eye from becoming involved. He considered that the arsenic compounds should always be followed by a course of mercury and potassium iodide.

Mr. S. H. BROWNING spoke from a large experience at Horseferry Road. He advocated many injections of one or other of the arsenic salts supplemented always by mercury. The mercury should be given either by inunction or as an intramuscular injection. He advocated the Wassermann test as being an essential indication as to treatment.

Colonel HARRISON spoke from an experience of over 40,000 injections of these salts. He stated that no treatment of syphilis was complete without one or other of them. He believed that kharsivan, salvarsan, and arseno-benzol were all equally efficacious. He was at present giving a concentrated course consisting of eight doses of 0.3 gram salvarsan and six injections of mercury in a month; the course was repeated after the lapse of two weeks if the Wassermann test was positive and if papillitis or ocular symptoms were present. With this line of treatment he had met with 1.6 per cent. of cases of dermatitis, including the very faintest macular eruption. He urged the importance of early diagnosis and early and vigorous treatment.

Mr. ERNEST LANE said that he had given up kharsivan, neo-kharsivan, and arseno-benzol on account of their toxicity. He referred to a case already reported by him in which, after two doses of kharsivan, exfoliative dermatitis and death ensued. He had given galyl almost exclusively during the last fifteen months in the following manner: Four doses of galyl were given at weekly intervals, followed by twelve intramuscular injections of calomel or grey oil, and after three months a Wassermann

test was made. Mr. Lane spoke favourably of luargol, the doses of which were 10, 15, 25, or 30 centigrams over two or three days until 1.2 grams had been administered. He insisted on the importance of early diagnosis and treatment.

Cures following Detachment of the Retina.

Mr. LESLIE PATON read the report of the committee appointed by the society to investigate the cases of cure of retinal detachments, composed of Messrs. Treacher Collins, Greeves, Mayou, Paton, Maitland Ramsay, and Storey. The committee had found it necessary to discard many cases on account of the incompleteness of the records, and no case was considered "cured" unless the retina was known to have remained reattached for at least six months. The 85 cases investigated were distributed amongst the literature as follows: 45 English, 26 German, 10 French, 4 American. In 44 cases the cure followed some operative procedure, and some other line of treatment in 41 cases. The etiological factor in the cases was in 50 myopia, in 11 traumatism, in 6 albuminuria, in 4 albuminuria of pregnancy, and in 1 pregnancy without albuminuria; 13 cases were "idiopathic."

Treatment of Large Traumatic Haemorrhages in the Vitreous.

Captain ORMOND, speaking from his experience at the 2nd London General Hospital, insisted on the desirability of discovering some means of assisting the rapid removal of large haemorrhages in the vitreous so as to prevent their organization with consequent shrinking of the globe. He believed that the beneficial effects of massage, subconjunctival injections, ionization, and dionine were due entirely to mechanical causes.

The Peripheral Lesions of Shell Concussion.

Mr. JAMESON EVANS tabulated 50 cases of defective vision ascribed to shell shock; he attributed 6 only to malingering or hystero-neurasthenia. He stated his belief that the ocular symptoms of shell shock were generally due to peripheral lesions rather than to commotio cerebri or psychic trauma.

In the discussion which followed Colonel LISTER took part.

The papers of pure ophthalmological interest were numerous, and were as follows:

Mr. S. Stephenson: A cyst of the pigment epithelium of the iris, with remarks.
Mr. M. Hine: Some observations with the Schiötz tonometer on the normal eye.
Mr. Treacher Collins: Contusion hypotony.
Mr. Affleck Greeves: Observations in a series of trephined eyes examined microscopically.
Mr. Richardson Cross: Severe kerato-iritis cured by tuberculin.
Mr. J. B. Storey: Implantation of fat after enucleation.
Mr. Beatson Hird: Notes on a case of tumour in the retina.
Mr. Gray Clegg: Spontaneous intraocular haemorrhages.
Mr. Maxwell: Capsulotomy after cataract extraction.
Mr. Leslie Paton: Functional spasm of accommodation.
Colonel Lister: Concussion changes in the retina and choroid.
Major Cunningham: Notes on some war wounds of the eye and orbit.
Captain Whiting: A preliminary note on concussion cataracts seen during the war.

Clinical Meeting.

At the clinical meeting at the Central London Ophthalmic Hospital many interesting cases were exhibited, and discussion followed. Captain PINCH, of the Radium Institute, took part in the discussion.

Museum.

During the congress a room was set apart as a museum, which had been got together and arranged by Mr. Mayou.

Localizing *x*-ray apparatus were shown by Dr. Finzi and Mr. A. D. Reid.

Mr. Holmes Spicer lent a collection of exceptionally beautiful drawings, made by himself, of disease of the fundus oculi.

Specimens exhibiting the results of perforation of the eye by foreign bodies were shown by Colonel Lister and Mr. Parsons (from the Moorfields Museum).

Mr. Mayou exhibited a combination electro-magnet and telephone probe.

Other specimens were shown by Messrs. Pooley, Mackay, Basil Graves, Jessop, etc.

CONTROL OF VENEREAL DISEASE.

AT a meeting of the Association of Registered Medical Women on May 9th, Dr. JANE WALKER in the chair, Dr. MARY SCHARLIEB, in opening a discussion on the conclusions and recommendations of the Royal Commission on Venereal Diseases, said that the Royal Commission was formed as a result of the great interest taken since the beginning of this century in the ravages of syphilis among children, combined with the increased possibility of successful diagnosis and treatment due to the discoveries of Schaudinn, Wassermann, and Ehrlich. With regard to notification, it had not been found a success in Scandinavia, while in Italy it was unnecessary, as all who were diseased went willingly for treatment, which was free, and no inquiries were made. At the time when salvarsan had been discovered Rome had been placarded with notices inviting patients to come for treatment. In England the whole subject was kept secret and regarded as shameful, and the result of wrong-doing and notification might lead to loss of employment and of club benefits, etc. Statistics were of little value, as doctors rarely gave syphilis as the cause of death; they gave rather the results, such as aneurysm, epilepsy, etc. Hospital statistics were difficult to obtain, and ordinary general hospitals did not admit cases of recent syphilis, which was regarded as the result of misconduct. A report obtained from a special inspection of Poor Law institutions showed very bad conditions. In some the venereal diseases had been treated in wretched wards, badly lighted and ventilated, the patients unnecessarily confined to bed, and in one the only visitors had been a pauper and his wife acting as caretakers, no doctor visiting the patients. The recommendation that patients, found on admission to a Poor Law institution to be suffering from a venereal disease, should be detained until cured, had been passed after much discussion. This was the most debatable point of the report. Investigation had shown that the examination of female prisoners was not adequate, and the majority considered that medical women should be appointed for this purpose. Education had been specially considered, and it had been suggested that special facilities should be given, both to old-standing practitioners and to medical students, to learn modern methods. The Commission had not been in favour of teaching sexual hygiene to school children. Children should be taught physiology, but not pathology; young adults should be instructed before going out into the world. Teachers in training colleges should receive special instruction to enable them to assist the students; the general public should also be given facilities for instruction, men lecturing to men and women to women. With regard to marriage, divorce, and nullity, if a husband infected his wife, adultery and cruelty could be proved, and divorce instituted. If the husband had been infected before marriage, the Royal Commission considered that he was not in a condition to fulfil his contract, and that nullity should be proclaimed, any children being safeguarded. The Commission also considered that doctors should be protected by law against actions for slander and libel if bona fide they gave essential information to individuals. The Commission thought it impracticable to legislate against quacks, but considered that the law against indecent advertisements should be put in force. In the discussion which followed, Drs. FAIRFIELD, JEVONS, BOLTON, BENTHAM, Lady BARRETT, and the CHAIRMAN took part. Dr. SCHARLIEB, in replying, suggested that opinions of members should be formulated and sent to her or to Dr. Jane Walker, who would bring them before the National Council for Combating Venereal Diseases, on which both were acting.

WE have received the first number of the *Journal of Bacteriology*, a new periodical that is to come out six times a year. It is the official organ of the Society of American Bacteriologists, and is devoted to the advancement and dissemination of knowledge in regard to the bacteria and other micro-organisms. It is planned to make the new journal in particular an organ for the more fundamental and general aspects of bacteriology, but it will also print many papers whose interest is mainly technical, particularly in those fields of bacteriology which have now no satisfactory organ of publication at their disposal. It will include original papers and abstracts of American and Canadian bacteriological literature; perhaps the other literature will be included later. The journal is published at Baltimore, U.S.A., by the Williams and Wilkins Co. It may be obtained in this country through the Cambridge University Press, the annual subscription being 23s. The journal makes a good appearance and no doubt satisfies a want. We wish it all success.

Reviews.

THE INVOLUNTARY NERVOUS SYSTEM.

A SERIES of monographs dealing with branches of physiology which have shown important advances in recent time is to be published under the editorship of Professor STARLING, and the first to appear, *The Involuntary Nervous System*,[1] by the late WALTER HOLBROOK GASKELL, forms an admirably fitting introduction, since it treats of questions which recur in connexion with practically all physiological phenomena. We may well congratulate ourselves that the author had completed the manuscript before his unexpectedly sudden death removed from us a personality who could so ill be spared.

Before Gaskell's researches the sympathetic system had been almost universally regarded as a kind of independent nervous system, presiding over the so-called "organic" or visceral components of the organism. This view was in great part due to the influence of Bichat. Although certain facts had occasionally been pointed out which were not altogether in agreement with this theory, the great advance made by Gaskell was the complete proof that the involuntary nervous system, with which the present monograph is concerned, is entirely motor or excitor in function, and consists of a set of motor neurones sent out from the cerebro-spinal nervous system to structures whose activity is involuntary. Further, that these motor neurones have wandered out from the central nervous system to a greater or less distance, and that the medullated fibres of the white rami are to be regarded as connector fibres, belonging to intermediate neurones, between parts of the central nervous system itself. It is important to note that the afferent nerves of the viscera are not subject to a distinction of this kind.

Gaskell was pre-eminently a man of wide ideas, ideas which have had the most astonishing effect in provoking further work. The great value of Langley's detailed investigations on the manner of distribution of the nerves of the "autonomic" system, as he proposes to call them, receives repeated recognition in the present book. One of Gaskell's master ideas was stated by himself in the preface as follows: "The broader physiological problems cannot be satisfactorily solved without the assistance of morphology, and conversely the larger morphological problems, such as those concerned with evolution, must take into account the facts of physiology." Accordingly, we find that the meaning and significance of facts is continuously brought before us.

We find discussed in order the motor functions of the sympathetic, the bulbo-sacral and the mid-brain outflows of connector nerves, the inhibitory nerves, rhythmic and peristaltic movements, the innervation of glands and the phylogenetic origin of the sympathetic nervous system. A final summary is given. A valuable bibliography and a fairly complete index conclude the work. The reader's grasp of the morphological arrangements described is greatly facilitated by the coloured diagrams. Since, in all probability, the book will become a classic, the suggestion may be made that a portrait of the author would be a suitable frontispiece in subsequent editions.

Before proceeding to further detail, a mild protest may be made against the spelling of the word "neurone." Since the *o* is long, the spelling in English should surely be as given, not "neuron." Similarly, "axon" should be "axone." It is probably due to German influence that the final *e* is omitted. We find Pavlov still spelt in the German fashion. The frequent occurrence in scientific writing of another Germanism, the use of complex adjectives, such as "adrenaline-containing nerve cells," to mean "nerve cells containing adrenaline" or "which contain adrenaline," should also be deprecated. Adrenaline is sometimes spelt without the final *e*, which belongs to it as a definite organic base.

There are several points of importance in connexion with the various systems of connector nerves referred to above, to which our attention is directed. All the vaso-constrictor nerves of the body arise from the thoracico-lumbar or "sympathetic" outflow. It is stated on p. 35 that there is no evidence whatever of vaso-constrictor fibres in other nerves. It might, perhaps, have been useful in the table on p. 36 to have given references to the papers which established the facts mentioned there, as it is not possible to obtain them from the bibliography. Further, from this same outflow are derived the motor nerves for the muscles of the sweat glands, for all unstriped muscle under the skin, and for all such muscle in structures derived from the segmental duct. The excitor nerves to the sphincters of the intestine arise from the same source. So that we have, as regards the motor or excitatory functions of this system, the supply of a layer of unstriped muscle under the skin, the blood vessels, the tubular structures of the segmental duct, and the sphincters of the intestine. With the constrictors of the blood vessels are to be included the accelerators of the heart. The name "vaso-dermal" is suggested for the muscular group in question. The unity of the sympathetic system is indicated by its extraordinary relationship to adrenaline, a fact to which further reference will be made. Indeed, this hormone is used as a test for sympathetic innervation.

In the bulbo-sacral outflow of motor connectors the cells are not arranged in a series of ganglia, as in the sympathetic, but in plexuses on the surfaces of the organs supplied. These are the plexus of Auerbach in the small intestine, and similar plexuses in outgrowths from this tube in the case of the vagus; on the large intestine and the uro-genital organs in the case of the sacral nerves, where the bundle of connectors is known as the "pelvic" nerve. An interesting discussion is devoted to certain peculiarities in the innervation of the bladder. Just as adrenaline picks out the sympathetic motor activities so does acetyl-choline pick out the motor activities of the bulbo-sacral connectors. The author proposes the name "enteral" for the latter system, to correspond with "sympathetic" for the former. The consideration in the fourth chapter of the outflow of connector nerves to the ciliary ganglion completes this part of the work.

The next chapter is devoted to the inhibitory nerves, and the author meets with greater difficulties here. It is first pointed out that we must admit the existence of nerves in the involuntary system which act upon muscle in such a way as to cause its relaxation directly and not by the putting out of action of a motor cell exciting the muscle, as in the case of voluntary muscle. The effect of adrenaline is evidence in addition to other facts. There exist, then, inhibitory nerves and cells in addition to motor ones. While the neurones of the two kinds are found peripherally in close contiguity, it does not always happen that the connector nerves pass out in the same outflow. In fact, as a rule, inhibitory cells of the enteral system have travelled out from the central nervous system along with excitor cells of the sympathetic and vice versa. An interesting fact is referred to in relation to this circumstance. The axones of many large nerve cells in invertebrates divide while still in the central nervous system. One fibre passes out as a large motor fibre to a group of muscles, while the other passes to the opposing muscles. It seems clear that one of the two must be inhibitory in function. The possibility of such an arrangement in the case of the cardiac fibres of the vagus is shown to be capable of explaining the apparent anomaly of these fibres being purely inhibitory in the majority of vertebrates, while having an excitor function on the muscle fibres responsible for the tonic changes in the tortoise auricle. Otherwise the double excitor and inhibitor innervation of the heart is clear. When we come to the inhibitory nerves of the blood vessels, the vaso-dilator nerves, we are met by the difficulty that in the activity of an organ metabolic products of an acid nature appear, which act directly on the muscle of the arterioles in such a way as to cause its relaxation. Nevertheless, there are many cases in which such an explanation of vascular dilatation is, to say the least, somewhat forced, and there is surely no difficulty in holding that the smooth muscle of the blood vessels resembles that in other situations in possessing a double innervation, and not one of excitors only. The explanation of the curious vaso-dilatation obtained from stimulation of peripheral ends of sensory nerves is perhaps one of the cases referred to in the preface as being not very satisfactory to Gaskell himself. It is rather remarkable that, while applying Langley's axone-reflexes to some

[1] *The Involuntary Nervous System.* By W. H. Gaskell, M.A., M.D., F.R.S. Monographs on Physiology, edited by E. H. Starling, M.D., D.Sc., F.R.S., F.R.C.P. London and New York: Longmans, Green and Co. 1916. (Med. 8vo, pp. 186; illustrated. 6s. net.)

other cases, he does not consider the possibility that has been suggested of its application to this case.

Chapter VIII is devoted to the consideration of the rhythmic movements of the heart and to the movements of the intestine. The former is especially valuable, as coming from the originator of the myogenic theory of the heart beat. Auerbach's plexus is regarded by Gaskell as demonstrably belonging to the vagus alone as regards its nerve cells, and this suggests an explanation of the "myenteric reflex," as it is called by Cannon, which does not involve the assumption of a true reflex. This explanation is on the lines of the fact referred to above, where the nerve fibres from one cell may simultaneously excite one muscle cell or motor neurone and inhibit another. A further discussion of this interesting question will be found on page 147 of the monograph. The phenomenon in the intestine must be a function of the vagus alone, since the sympathetic supplies no nerve cells to it. It seems that the original name of "law of the intestine," given by Bayliss and Starling may turn out to be more correct than the later one of Cannon.

As to the innervation of glands with ducts, it is pointed out that, omitting the kidney, which belongs to another category, there are two systems of nerve cells—namely, (1) those supplying epidermal structures, sweat glands, etc., which belong to the sympathetic system, and (2) those of the enteral system, belonging to the bulbar outflow. At the two extremities of the body a mixture takes place, so that the salivary glands, for example, receive a secretory innervation from both systems.

Chapter X gives an account of the position of the cells in the central nervous system from which the connector fibres of the involuntary nervous system take origin. The sympathetic and sacral outflows clearly arise from the lateral horn. Those in the cerebral outflows have a more complex origin, but there is much evidence for the view which assigns their origin to a column of the same nature as the lateral horn of the spinal cord.

As is natural, we find repeated references to the author's well-known theory of the origin of vertebrates, and Chapter XI is specially devoted to the phylogenetic origin of the sympathetic system. Whatever may be the opinion held as to the main theory, there can be no doubt of the extraordinary manner in which it throws light on difficult problems. It should receive welcome from the physiologist especially, on account of the preponderance given to the evolution of the central nervous system, with its control of the whole organism. The present reviewer regards the evidence as strong enough to bring almost complete conviction. Space does not permit of more than reference here to the interesting relations of the chromaffine cells and their adrenaline content to the sympathetic system.

Enough has been said to show how necessary a knowledge of the contents of this important monograph is to all those concerned in any way with the involuntary nervous system, be they morphologists, physiologists, or engaged in the practice of medicine.

W. M. B.

CLASS GYMNASTICS FOR WOUNDED MEN.

WE noticed some time ago the appearance of a book by Dr. M. Carle (BRITISH MEDICAL JOURNAL, December 11th, 1915, p. 862) describing the schools for the industrial training of disabled soldiers established in France, and a further reference to the matter will be found in the JOURNAL of May 6th, p. 668. A small volume recently published by Dr. CH. GUILBERT and M. G. MAUCURIER[2] supplements Dr. Carle's book by describing the advantages of gymnastic classes for dealing with the re-education of wounded soldiers at certain stages. Dr. Guilbert is at the head of the department for treatment by movement and gymnastics at the military hospital in the Grand Palais, Paris, and M. Maucurier is professor of physical education in the public schools of Paris. The authors, while fully recognizing the necessity for individual treatment in the early stages of most cases, have found that gymnastic exercises in class may be extremely useful later on; their book describes at length the various exercises which they have found most generally applicable. They attach great importance to the mental effect when men suffering from similar disabilities do exercises together. A spirit of emulation is aroused, and the appeal to his imagination encourages a man to make efforts which, if working by himself, he would find wearisome. Gymnastics in class are not applicable until the patient has attained a certain power of movement, but once that stage has been reached progress may be rapid. It has been found that no lesson should last more than half an hour, that no class should consist of more than twenty men, and that the teacher should have the help of a monitor who will show individuals who fail to accomplish a movement where their fault lies. The difficulty of obtaining good monitors is recognized; some have been found among wounded men who have themselves made good progress. They are given a short course of instruction for three or four weeks and then begin to work under the teacher. The greater part of the book consists of detailed instructions for various types of exercises with and without appliances. The directions are illustrated by excellent sketches, and the book altogether is of a thoroughly practical and helpful character.

[2] *Guide de rééducation physique en groupe. Méthode de gymnastique rééducative pour les blessés militaires.* Par le Dr. Ch. Guilbert et G. Maucurier. Paris: J. B. Baillière et Fils. 1916. (Cr. 8vo, pp. 128; 59 figures. Fr. 2.50.)

PERSIA.

DR. A. R. NELIGAN,[3] physician to H.M. Legation at Teheran, has written an excellent account of the medical knowledge that should be at the disposal of all residents and travellers in Persia. There are but few of either class, so far as our own countrymen are concerned, now in Persia. In the past, however, Persia has owed much to the activities of its more civilized European residents; and when the shadow cast on all Eastern countries by the present war of German aggression has passed by, no doubt the British officials, travellers, and traders will return to Persia once more. Dr. Neligan's book combines the functions of a medical manual for laymen with those of a general guide to the country and its chief routes for travellers; the earlier pages give a brief account of how to live and dress and eat in Persia. Antityphoid inoculation is mentioned as an indispensable preliminary to travelling in Persia; water must never be drunk without preliminary boiling; mosquitos occur in most parts of the country, and mosquito nets should always be at hand; derangements of the digestion are peculiarly common, and often due to certain articles of Persian diet that prove too much for the unarmed digestive powers of Europeans. More than half the volume is taken up with details of the main routes in the country, with a few notes about the chief places and objects of interest to be seen. The notes as to the use of motor cars in Persia lead one to suspect that the roads must be generally execrable. The book is full of interest, and should have a future.

NOTES ON BOOKS.

VOLUME III of the second edition of the *Encyclopaedia Medica*,[4] issued under the general editorship of Dr. J. W. BALLANTYNE, contains articles from *Chloroform* to *Dyspnoea*. The authors are for the most part Scotsmen of medical or surgical distinction. Among the most important and interesting articles in the volume are those on chlorosis, chorea, colour vision, convulsions, deformities, diabetes, diet, and dysentery. The general scope and excellence of this *Encyclopaedia* are well known, and need not be emphasized further in the present brief note. It may be added that the article on diabetes insipidus would, perhaps, gain by a reference to Finkelnburg's work on the division of the cases—namely, those with a primary polydipsia and those with a primary polyuria; further, a reference might with advantage be given to Weil's account of the 229 descendants of one J. P. Schwartz, in five generations, out of whom 34 exhibited hereditary and apparently harmless diabetes inspidus.

The Seven Ages of Woman,[5] by Dr. MARY SCHARLIEB, is the best book of its kind we have seen. It is written in an

[3] *Hints for Residents and Travellers in Persia.* By A. R. Neligan, M.D.Lond., M.R.C.S.Eng., D.T.M. and H.Cantab. London: J. Bale, Sons, and Danielsson, Ltd. 1914. (Cr. 8vo, pp. 201; 1 map. 5s. net.)

[4] *Encyclopaedia Medica.* Under the general editorship of J. W. Ballantyne, M.D., C.M., F.R.C.P.E. Volume III, Chloroform to Dyspnoea. Second edition. Edinburgh and London: W. Green and Sons, Ltd. 1916. (Roy. 8vo, pp. 680; illustrated. 20s. net.)

[5] *The Seven Ages of Woman: A Consideration of the Successive Phases of Woman's Life.* By M. Scharlieb, M.D.Lond. London, New York, Toronto and Melbourne: Cassell and Co., Ltd. 1915. (Post 8vo, pp. 299. 6s. net.)

easy, pleasant way, and in it advice and guidance are given, as its title suggests, to girls and women. The book is divided into seven parts, and begins with most helpful advice on the upbringing of girls. The parts devoted to the young wife, the young mother, and nursing mother, are likely to be particularly helpful to those to whom they are addressed, for in them the advice is sound and practical, neither alarming the ignorant nor making the more experienced mother too bold. The chapter on the "Mother in the noisy years" deals with the problem of childhood, while that on the "Woman in middle and old age" shows how health may be maintained when the vigour of life is passing. Mrs. Scharlieb seems to us to have struck the right note throughout the book, and the appendix with its list of simple formulae will be useful to those who turn to the book for help and guidance. We would suggest that it would have been better to have adopted a paper cover to the book less in the style of the cheap novel of the bookstall, and we trust this may be done in future editions.

CEREBRO-SPINAL FEVER.

THE Local Government Board in England has issued a Blue Book of nearly 200 pages on cerebro-spinal fever, with special reference to the occurrence of the disease since the outbreak of the war.[1] The volume contains five reports by different workers, and an introductory memorandum by the medical officer.

Epidemiology.

Dr. Bruce Low contributes an essay occupying some seventy pages on the prevalence of cerebro-spinal fever throughout the world in recent times. It gives a very clear comprehensive survey of the history of the disease for the last thirty years, within which period knowledge of its nature has made great progress. It describes the occurrence of the disease in the British Isles at considerable length, and then passes on to the observations of outbreaks in France, the Low Countries, Scandinavia, Germany, Austria, Russia, Roumania, the Mediterranean, Switzerland, Portugal, and Spain, as well as in Africa, New Zealand, India, China, and in the American continents. The essay will possess permanent value, but it is particularly useful at this time in that it puts recent outbreaks in proper perspective.

Dr. R. J. Reece has written a report on cerebro-spinal fever among the civil population in England and Wales with special reference to outbreaks in certain districts during the first six months of 1915. The districts especially dealt with at length are Wiltshire, where a certain number of cases occurred in the second part of 1914 and in the early part of the following year, Reading, Bristol, Portsmouth, and Liverpool. It does not include a full account of the incidence of the disease among troops, but this report, and that of Dr. Bruce Low, give examples of the excellent work done by the medical executive of the Local Government Board. They show that though small outbreaks occurred in the British Isles at earlier dates, the first of any magnitude to be recognized took place in Glasgow and Belfast in 1907. As it is well known that the bringing together of a large number of recruits in camps and billets is very apt to be followed by a prevalence of the disease, the danger was foreseen, but as a matter of fact it appears that one of the Canadian contingents had cases at Valcartier camp before leaving Canada; cases continued to occur after they had reached this country and were encamped on Salisbury Plain, and the disease was definitely established among them by the end of 1914. It should be noted, however, that a few cases had occurred among the civil population early in the autumn, and a few more in December. During the first half of 1915, 9 cases occurred in Wiltshire, the largest number being observed in February. In 1915, 40 cases occurred in the city of Salisbury, which had become a busy military centre, 11 in other urban districts in the county, and 39 in rural districts. The Corporation of Salisbury established under the direction of Dr. Penfold, of the Lister Institute, a bacteriological laboratory for the diagnosis of cases and for the detection of carriers. The inhabitants were advised to submit to inoculation with a vaccine prepared from killed cultures of a local strain of the meningococcus, and the M.O.H., Dr. Fison, estimates that at least 3,500 persons received preventive inoculation—that is to say, about 31 per cent. of the census population. Special attempts were, however, made to secure the inoculation of all contacts, and the results were such as to encourage resort to this measure in any future outbreak. Dr. Fison reported that the reaction from the inoculation was not severe, that no inoculated person contracted the disease; in two instances all the junior members of a family had been inoculated except the one attacked, and in another the father was attacked, but his inoculated children escaped. The outbreak in Reading included some twenty cases among the troops billeted in the town. The first civil case occurred on January 14th, and no connexion with the military could be traced. The first military case occurred on February 7th. The danger was dealt with energetically by the corporation and its officers with the assistance of the military authorities by way of isolation, early bacteriological diagnosis, and treatment of contacts. Cases, however, continued among the civil and military population during the whole of the period under review—namely, the first six months of 1915. In Bristol 90 cases were notified in the first six months of 1915. There had been 32 cases among the civil population in 1914, the majority children, though 6 were over 20 years of age. In Portsmouth the first cases occurred among the naval and military population, but subsequently over 50 were notified among the civilians. A small outbreak in Winchester seems also to have originated from the military. In a concluding note Dr. Reece points out that of the 2,045 cases known to have occurred in England and Wales during the first six months of 1915 the majority—1,656, or 81 per cent.—were observed south of a line drawn from the Wash to the Bristol Channel. For military purposes the greater number of troops were stationed in the east and south-east part of England, and the facts, he considers, confirm the belief that a manifestation of the disease was in some way associated with the presence of troops in the areas specially affected.

Bacteriology.

The bacteriological questions which arise are discussed in three reports by Dr. Eastwood, Dr. F. Griffith, and Dr. W. M. Scott; these are concerned largely with the prevalence of meningococcus-like organisms in the naso-pharynx. Dr. Eastwood, however, gives a long and interesting historical survey of the growth of knowledge, but he begins with 1906, so that he attributes to Lingelsheim the first observations on the value of fermentation tests for these organisms, thus ignoring the paper by Dunn and Gordon published in this JOURNAL in August, 1905, in which Lingelsheim's results were to a large extent anticipated.

In the second part of his report Dr. Eastwood gives an account of the investigations made in the Board's laboratory, describing the method adopted by himself and Dr. Fred. Griffith for the investigation of meningococci from cerebro-spinal fluid, and relates investigations made by them and by Dr. W. M. Scott on naso-pharyngeal swabs from non-contacts. The contribution from Dr. Griffith is on the identification of the meningococcus in the naso-pharynx, with special reference to serological reactions. His general conclusion is that all strains of Gram-negative cocci obtained from the naso-pharynx which are identical microscopically, culturally, and in fermentation tests with meningococci must, in default of a specific test for virulence and until the serological relations have provided definite evidence to the contrary, be considered to be meningococci.

Dr. W. M. Scott's conclusion from his study of meningococci occurring in spinal fluid and of similar organisms in the naso-pharynx does not materially differ. He states that micro-organisms indistinguishable from meningococci by microscopical, cultural, and fermentation tests were found in the naso-pharynx in 22 per cent. of 138 non-contacts from an urban population (Lambeth out-patients). In 63 per cent. of these organisms the serological tests, he considers, confirmed their identity with meningococci, or their close relationship to them. The agglutinating properties of the organisms were not, in general, so strongly marked with the serums used as those of known pathogenic strains, but they showed definite absorption

[1] Reports of the Local Government Board on Public Health and Medical Subjects in series. No. 110: Reports on Cerebro-spinal Fever. Price 2s.

of the specific agglutinin. They appeared to differ from the majority of the spinal strains not in the quality, but in the quantitative intensity of their specific affinities. Some spinal strains, however, resemble them in this. The patients, as has been said, were believed not to have been in actual contact with cases of cerebro-spinal fever, but a considerable number of cases of the disease were occurring in London and elsewhere, so that this point does not seem to be completely established.

Dr. Newsholme, in his introductory memorandum, expresses the opinion that the special importance of the results obtained by the investigations of the Local Government Board lies in the fact that they were concerned with persons who had not been in close association with cases of cerebro-spinal fever. He acknowledges that the investigations, which are being continued, have not, so far, settled the question of the measure of importance which should be attached to the finding of meningococcus-like organisms in the naso-pharynx.

From the summaries of the investigations of Drs. Eastwood and Griffith it appears that altogether 480 swabs from the naso-pharynx of non-contacts were examined, and that of these 49 yielded cultures which resembled meningococci in their morphological and cultural characters, and in their response to fermentation tests. It appears that of these 49 cocci 28 were investigated serologically. For this purpose Dr. Griffith used, we gather, seven monovalent serums prepared by him from strains isolated from the cerebro-spinal fluid of cases of the disease. While 15 of the naso-pharyngeal cocci showed good agglutination, 6 gave a less marked result, and 7 gave either a slight or a negative reaction. It is added that five of these naso-pharyngeal strains absorbed from the respective agglutinating serums the specific agglutinin for the homologous strain of meningococcus, but nothing is said as to the behaviour of the others in this respect. In an attempt to summarize the matter, we find that out of 49 meningococcus-like organisms collected from the naso-pharynx of 480 non-contacts 28 were submitted to serological examination, and that of these 5 gave evidence by absorption tests that they were true meningococci. As to all the others considerable doubt must be felt, and from Dr. Newsholme's observation on the point it would appear that the serological evidence is against their being meningococci. Dr. Scott examined the naso-pharyngeal secretion from 138 out-patients at the Lambeth Infirmary and 56 children at a rural school in Kent; 30 of the Lambeth cases and one of the school children yielded cocci that resembled the meningococcus in their cultural and fermentative characters; 29 of them were submitted to serological tests, and 7 showed complete agglutination at 1 in 200, or in higher dilution; 12 did not appear to have agglutinated in a higher proportion than 1 in 100, and the remainder, including that from the school child, showed only slight agglutination with the serums employed. On the whole, therefore, it does not seem that the evidence Drs. Eastwood, Griffith, and Scott have advanced establishes the proposition that more than a proportion of the meningococcus-like organisms found in the throats of these non-contacts were true meningococci.

Difficulties in the Identification of the Meningococcus.

There can be no doubt that the identification of the organism in the naso-pharynx is not a simple matter. One difficulty arises from the fact that the investigation during the recent epidemic of meningococci from the cerebro-spinal fluid itself has shown that while the organisms may be alike in their morphological, staining, cultural, and fermentative characters, they differ among themselves in their serological characters. A number of types have been distinguished, but it would appear from the work of Colonel M. H. Gordon and Mr. E. G. Murray at the Central Cerebro-spinal Fever Laboratory at the R.A.M. College, Millbank,[2] that, so far as concerns cases of cerebro-spinal fever occurring among the military in this country, only four different types need, for practical purposes, be considered; of these four types only two occurred with any considerable frequency. Captain Ellis and Dr. Arkwright have also found evidence of at least two distinct types. Another difficulty in the way of the investigators is that the naso-pharynx and other parts of the upper respiratory passages habitually contain various sorts of Gram-negative cocci. The more common of these differ so much in their morphological, cultural, or fermentative characters from the meningococcus that they can be easily distinguished. There are other Gram-negative cocci, however, which it would seem can only be distinguished from the meningococcus by their serological characters. This test, therefore, is of great importance, and appears to be the most trustworthy means of identifying the meningococcus of any one of the various types distinguished. Elser and Huntoon, of whose researches for the Health Board of New York Dr. Eastwood gives an account, as well as other workers both in Germany and in this country, have fully established the point that Gram-negative cocci may be found in the naso pharynx which resemble the meningococcus in morphological, cultural, and fermentative characters, but are serologically distinct, and Elser and Huntoon apply to them the term "pseudo-meningococci," distinguishing six strains. These pseudo-meningococci have been found in certain cases of catarrh and colds in large numbers in the secretion of the respiratory passages, and may possibly be the cause of catarrh, but so far as present evidence goes they are not true meningococci.

Immunology.

From the report of the Medical Research Committee already mentioned, it appears that Colonel Gordon and his colleagues at the R.A.M. College have now worked out in detail the immunological characters of the strains of meningococcus concerned in the past epidemic, and the laboratory now supplies monovalent rabbit serums which will agglutinate all the epidemic strains of meningococci commonly found up to a dilution of 1 in 400. These homologous serums will, it is expected, facilitate the recognition of the epidemic types of the meningococcus, and will, moreover, afford the serum treatment a better chance than it has hitherto had to prove its value. Not only will it be possible to produce a properly balanced polyvalent serum for general use, but by identification of the type of coccus in any given case the way will be opened for the use of a monovalent homologous serum presumably of greater potency. Such serums are already in preparation. Provided with a series of specific agglutinating serums of the various types of meningococcus occurring in the cerebro-spinal fluid, the bacteriologist will be able to distinguish the true meningococcus when it occurs in the naso-pharynx, and will be justified in refusing to admit any suspect coccus from the naso-pharynx to be a true meningococcus unless its serological behaviour corresponds with one or other of the types found in the cerebro-spinal fluid of developed cerebro-spinal fever.

[2] Medical Research Committee. Report of the Special Advisory Committee upon Bacteriological Studies of Cerebro-spinal Fever during the Epidemic of 1915. London: H.M. Stationery Office. 1916. Price 6d.

THE DR. JAMES B. BIRD MEMORIAL FUND.

IN the notice of the life of Dr. J. B. Bird, of Carlisle, published in the JOURNAL of May 13th, p. 706, it was said that he had died at so early an age that he had been unable to make due provision for his family, and that a committee had been formed for the purpose of raising a memorial fund for the education of his children. We are informed that the fund already amounts to £1,190; further subscriptions should be sent to the honorary treasurer, Mr. James Nelson, Bank of Liverpool, Limited, Carlisle. The fund will be administered by trustees. The proposal has been warmly taken up by the members of the Border Counties Branch, and the following is a list of subscriptions already received from medical friends:

	£	s.	d.
Dr. Henry Barnes, Carlisle	10	10	0
Dr. Lediard, Carlisle ...	10	10	0
Dr. W. S. Syme, Glasgow	10	10	0
Dr. Easterbrook, Dumfries...	5	5	0
Dr. Clarke, Dumfries ...	5	5	0
Dr. George Martin, Silloth	5	5	0
Dr. G. R. Murray, Manchester	5	5	0
Dr. W. Murray, Eden Brows	5	5	0
Dr. Goodchild, Blencathra Sanatorium ...	5	0	0
Dr. E. M. Dolan, Wigton	3	3	0
Dr. A. Smith Hannay, Wigton	3	3	0
Dr. Maxwell Ross, Dumfries...	3	3	0
Dr. Crerar, Maryport ...	3	3	0
Dr. Murphy, Carlisle ...	2	2	0
Dr. G. H. Ruston-Harrison, Winscombe, Somerset	2	2	0
Dr. Mathews, Kirkby Lonsdale	2	2	0
Dr. Coulthard, Aspatria	2	2	0
Dr. J. Findlay, Blackpool	2	2	0
Dr. J. K. Duff, Aspatria	1	1	0
M.B.	1	1	0
Dr. Martin, Newbridge, Dumfries	0	10	6
	88	9	6

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CERVANTES AND MEDICINE.

CERVANTES, the tercentenary of whose death, like that of Shakespeare, falls in the present year, took as keen and intelligent an interest in medicine as his great contemporary. Hernández Morejón, in his *Historia Bibliografica de la Medicina Española*, devotes a chapter to the "beauties of practical medicine discovered in the immortal work of Cervantes." Olmedilla y Puig, Cristóbal Pérez Pastor, Menéndez Pelayo, Pardo Figueroa, and many other writers have treated of his medical knowledge. His father, Rodrigo de Cervantes, was a surgeon apothecary, and he had himself a considerable experience as a patient. At Lepanto, when his ship, the *Marquesa*, came into action, he was below, ill with fever, but he insisted on playing his part in the fighting, and received three gunshot wounds, two in the chest and another which permanently maimed his right hand. The hardships and privations which he endured as a captive in the hands of the Moors, and the lifelong poverty and frequent imprisonment which he suffered after his escape undermined his health. Professor José Gomez Ocaña, of the University of Madrid, in his essay on the clinical history of Cervantes published in 1899, expressed the opinion that he was the subject of arterio-sclerosis and heart disease; it is known that he died of dropsy. The word "corazon" (heart) occurs 141 times in *Don Quixote;* of course it is not always used in the literal sense, but this frequency may perhaps not be without significance. Cervantes mentions about a hundred plants, describing their medicinal and alimentary uses, and he was acquainted with the great compilation of Dioscorides on materia medica, at least in the Spanish translation of Andrés Laguna of Segovia, physician to Charles I (afterwards the Emperor Charles V) and Philip II. He had also read Pliny's *Natural History*, then held in Spain, as it was in England at that day, as of high authority on all things medical. He speaks of poisons which breed madness in men's brains, and discharges shafts of satire at druggists and doctors, but it is only pretenders and impostors at whom they are aimed.

In more than one passage Cervantes scoffs at secret and superstitious remedies. When Don Quixote is losing blood after a fight, he regrets that he had not by him the Balsam of Fierabras, a medicine of such potency that if his body were cloven in twain, one part could be accurately adjusted to the other "before the blood congeal," when two draughts would make him "sounder than an apple." This balsam was believed to be a part of that used by Joseph of Arimathea to embalm the body of Christ. Elsewhere Sancho prepares for his bruised master a compound of simples, over which he says a number of Paters, Aves, Salves, and Credos, with many signs of the cross.

Cervantes makes some unmistakable allusions to venereal disease. In *El Casamiento Engañoso* there is a description of an unfortunate officer leaving hospital where he had sweated away fourteen loads of buboes given him by a woman. In the same work mention is made of a disease called *lupicia* (alopecia) or *pelareta* (from *pelar*, to pluck out hair), treated by sweating, which makes all the hair, including the eyebrows, eyelashes, and beard, fall out. The scene of the Coloquio de los Perros in the *Novelas Ejemplares* is laid in the hospital of the Resurrection at Valladolid. In many places Cervantes dwells on the hygienic value of plain diet and moderation in eating. Delightful fun is made of the dietetic crank, Dr. Pedro Recio de Agüero, who stands beside Sancho when he is at table and condemns the various dishes set before him—one as being too moist, another too heating, and so forth, till the starving governor of Barataria threatens to knock him on the head with the chair on which he is sitting, saying that if he is charged with murder he will plead in excuse that he has rendered a service to God by killing a bad doctor.

It was disease of the mind which most interested Cervantes, and Pi y Molist has written a book on him as a medical psychologist. If Cervantes does not bring so many mad folk before us as Shakespeare, he gives in *Don Quixote* the most finished picture in all literature of a certain type of insanity. Much reading of romances of chivalry had made the Knight of the Sorrowful Countenance mad. On all other subjects he was of good understanding and could discourse rationally. Cervantes speaks of hallucinations of smell which make the Don describe as an aromatic fragrance the odour diffused by his Dulcinea and attributed by the prosaic Sancho to perspiration from much exercise. He also refers to the loss of memory which makes the Knight exaggerate his adventures as caused by continual and extraordinary labours. The methods by which those about him seek to divert his mind from the exalted ideas which had led him to go about in search of adventures show that his creator had a clear notion of the value of moral treatment. The last illness of Quixote, in which he passes from madness to profound melancholy and recovers his reason with the onset of fever, may be compared with the death of Lear. Sancho Panza is an example of what Charles Lamb calls the "twilight state of insanity, the madness at second hand, the contagion caught from a stronger mind infected." In *El Licenciado Vidriera* Cervantes gives a picture of madness brought on in a student of Salamanca by a love philtre, such as is said to have caused the death of Lucretius. The young man imagined that he was made of glass from head to foot; when any one came near he would call upon him with terrible cries to keep away, lest he should be broken.

In the "Colloquy of the Dogs" we get a glimpse of the overcrowding of the medical profession in Cervantes's day. A student of Alcalá is quoted as saying that of the 5,000 students in that university 2,000 belonged to the medical faculty. The comment on this remark is that either all these doctors would require to have sufficient patients to cure—"which would be a terrible disaster"—or they must die of hunger. This makes one think of Abernethy's exclamation, on entering the crowded theatre of St. Bartholomew's on the opening day of a winter session: "God help you, gentlemen! What is to become of you all?"

The number of references in the works of Cervantes to medical subjects might be multiplied indefinitely. Like Shakespeare, he knew something of everything. He was not only a man of the most powerful creative faculty, but a close observer of facts and a deep thinker. It is not surprising, therefore, that he should have been made the subject of study by doctors. It would, of course, be absurd to regard *Don Quixote* as a medical treatise. But it is one of the profoundest studies of human nature ever made, and as such it is full of

instruction for the doctor, for there is a deep truth in the saying of a Spanish physician, Letamendi, that the man who only knows medicine does not know even that. The story of Richard Blackmore asking Sydenham what books of medicine he should read and being told, "Read *Don Quixote;* it is a very good book; I read it still," is well known. On this Johnson in his ponderous way observes that "the perverseness of mankind makes it often mischievous in men of eminence to give way to merriment. The idle and illiterate will long shelter themselves under this foolish apophthegm." But is it foolish? According to Frank Payne the obvious meaning is "Read what you like; reading books will never make a doctor." This interpretation would be quite in keeping with the character of Sydenham, who despised book learning and had no great respect even for science. But we are inclined to believe that he was at any rate partly in earnest, for the practitioner's equipment is incomplete without a knowledge of human nature, and this can only be got by a study of the great masters of the human heart who hold the keys that open the fountains of tears and laughter. Chief among them are Shakespeare and his immortal Spanish contemporary.

BACTERIOLOGY AND BREWING.

BEER has but few outspoken friends nowadays. Its patrons may still be many, whatever the degree of success attained by the discouragements effected by the Central Liquor Control Board, and however excellent the work of that Board is. But there is nothing heroic about the subjects of beer and brewing, nothing to stir the imagination. Hence people are apt to forget the great influence exercised by the brewing industry upon the development of the science of bacteriology in the Sixties, Seventies, and Eighties of last century. This influence has been traced out in detail by Mr. Horace T. Brown, F.R.S., in an interesting address read before the Institute of Brewing last week. Mr. Brown has been closely connected with the brewing industry for half a century, and so is enabled to speak with first-hand knowledge of the trials and triumphs of those who endeavoured to apply scientific method to brewing practice in those far-off days.

It is just sixty years ago since Pasteur began his epoch-making studies in fermentation. He was living in Lille, and distillation was a very important industry in the town and its neighbourhood. He was consulted by a Lille distiller named Bigo, in 1856, as to certain difficulties met with in the manufacture of alcohol from beetroot. At that time the prevailing scientific notions about fermentation were those formulated by the celebrated chemists Liebig and Berzelius, and were wholly erroneous. The latter attributed fermentation to an obscure catalytic force, and regarded the yeast cells as a mere precipitation of a vegetable principle during the process. Liebig, on the other hand, defined ferments as extremely alterable organic substances able, under the influence of oxygenation, to communicate molecular motion to sugar and induce its decomposition into alcohol and carbonic acid gas.

Such ideas as these, however interesting from the historical point of view, were naturally sterile when confronted with the practical difficulties of the brewer. Pasteur swept them all aside, and after elaborate study and experimentation was able to state in 1860 that alcoholic fermentation was correlative with the life and organization of the yeast cell; a few years later he was able to go further and show that each of many fermentative processes had its own specific organism by which it could be recognized. He linked up his work on alcoholic fermentation with that on the souring of milk and the lactic fermentation of sugar; and in 1863 took up the study of the fermentations involved in the production of wine, the greatest of French industries, publishing a book on the subject in 1866. Continuing his work on industrial fermentations, he wrote a book on the subject of beer in 1876. Thus the first twenty years of his active scientific life were largely occupied with the investigation of problems raised by the great fermentation industries, and he returned to them again and again in later years, as his biographer Vallery-Radot shows. The practical commercial value of his discoveries was incalculable; the scientific importance of the work was no less, and may not unfairly be regarded as one of the contributions made by beer to bacteriology. But beer has contributed more than that. Mr. Brown gives a most instructive analysis of the influence exercised by Pasteur's work on the development of Lister's antiseptic surgery in the Sixties. The researches from which Lister drew his inspiration were those suggested to Pasteur by his observations in Bigo's distillery at Lille.

Mr. Brown has many interesting facts to record in illustration of the slow progress made with the introduction of scientific methods into the conservative art of brewing. In the late Sixties there was no laboratory at all in the great Burton brewery he entered. It was not until 1869 or 1870 that he turned his attention to the systematic use of the microscope in his brewing work. The polarimeter, now indispensable to the brewing chemist as a means of estimating sugars, was not applied to this obvious service until 1870, when O'Sullivan took it in hand with brilliant results. The scientific members of the staffs of the various Burton breweries waited till 1876 before forming an informal scientific club for the discussion of scientific discoveries in chemistry and biology that had a bearing on the fermentation industry. It was not till 1879 that Hansen's work on the identification and cultivation of pure yeasts at the Carlsberg laboratory in Copenhagen began. It was not till the close of last century that the Guinness Research Laboratory was started in Dublin; for it Mr. Brown laid out a detailed scheme of work in 1901. In the closing paragraphs of his address Mr. Brown points out many other particulars, besides those already mentioned, in which science owes a debt to the fermentation industries; at the same time he shows how the benefits conferred have been mutual.

Other sciences besides bacteriology have gained by investigations set on foot by workers primarily interested in brewing. Chemistry has been enriched by a vast amount of work on enzymes, sugars, starch, to mention but a few out of many pioneer labours; vegetable physiology has learnt much from brewers, more particularly with regard to the synthesis of starch from carbon dioxide by chlorophyll-containing leaves; Pasteur's work on crystalline isomerism and molecular asymmetry was suggested to him by his bacteriological studies in the first instance, and has developed into the corner-stone of organic chemistry. Therapeutics has received illumination, as, for example, from the work of Raulin, a pupil of Pasteur, who found that minimal quantities of zinc salts might exercise a wholly disproportionate influence on the freedom with which moulds grow in artificial media; even 1 part of zinc in 100,000 of the nutritive solution in which the fungus was grown seemed

sufficient for its needs. This work has recently been confirmed and extended by Javillier,[1] who found that the addition of 1 part of zinc to over 50 million parts of culture medium was enough to increase the growth of the mould by 30 per cent. Figures such as these impress the imagination with the importance of the infinitely little, and at first sight may even seem to offer a general confirmation of the views of homoeopathy. But, applying the same figures to the case of a human being and the drug arsenic, it will be seen that the "infinitely little" suggested by the dilution of one in fifty million, in the case of the mould, is really a commonplace of daily medical practice. In Javillier's experiment quoted above the amount of zinc involved was 0.005 mg. in 250 c.cm. of culture medium, the amount of mould grown was 2.5 grams, dry weight, and the proportion between the two last quantities was 1 to 500,000. In the case of a human being weighing 11 st. the dry weight may be taken as 66 lb., or 462,000 grains; while the pharmacopoeial dose of arsenious acid is given as from one-sixtieth to one-fifteenth of a grain. Clearly, then, in order that the human being may receive as much arsenic, relatively, as the mould received of zinc in Javillier's experiment, a great many doses of the arsenic must be exhibited; in other words, the human being is more sensitive to the action of arsenic than the mould is to salts of zinc.

These considerations have led us rather far, perhaps, from the thesis of Mr. Brown's vindication of the scientific value of the fermentation industries and the history of their development from the laboratory point of view. But nobody can read his address, inspired as it is by the conviction bred of a deep knowledge of the subject, without feeling that in the growth of bacteriological science the art of brewing has played a most important part. And these are not the days when such a debt to the brewing industry should be forgotten.

[1] See A. J. Brown's Cantor Lectures, Royal Society of Arts, 1911.

THE LISTER INSTITUTE.

THE annual meeting of the members of the Lister Institute was held at the Institute, Chelsea Gardens, on May 17th. Surgeon-General Sir David Bruce, C.B., F.R.S., the chairman of the Governing Body, who presided, in presenting the annual report referred to the loss the Institute had sustained by the death of Sir Henry Roscoe, who took an active part in its foundation, and who had been subsequently, first as treasurer and afterwards as chairman of the Governing Body, intimately concerned with its welfare throughout the whole of its history. The Institute had also lost by death Mr. Pattison, who had been treasurer since 1899. His place had been taken by Lieutenant-Colonel G. W. Addison, R.E. In pursuance of the policy instituted by the Governing Body in 1914, the Institute had continued during 1915 to devote its energies almost entirely to war work. It had been deprived of the services of many of its permanent staff, including the director, Professor C. J. Martin, and many voluntary workers in the laboratories, who had been claimed by the army. The amount of original investigation and the number of papers published were on this account much smaller than usual; on the other hand, a great deal of important work in relation to the prophylaxis of disease had been carried on. The bacteriological department had prepared large quantities of typhoid, paratyphoid, and cholera vaccines for military purposes, and researches on the disinfecting action of hypochlorites were being conducted by Dr. Schütze, and on prophylactic dysentery vaccines by Dr. J. D. Thomson. The Chairman paid special tribute to the manner in which Dr. MacConkey had overcome many difficulties at Elstree, and with the assistance of Dr. Zilva and Miss Homer had prepared large quantities of antitoxins for the use of the army and navy. Cultivations of strains of the meningococcus isolated from cases of cerebral meningitis had been used for the immunization of horses, and the serum so obtained had been employed with success both in France and at home. Much use was being made of the Institute's antidysentery serum, which also had given good results. The Governing Body expressed its indebtedness to the Hygienic Laboratory of the Public Health Department of the United States of America and to its director, Dr. J. F. Anderson, for the generous manner in which, after the outbreak of war, they placed at the disposal of the Institute supplies of standard diphtheria antitoxin and standard tetanus toxin. In the department of experimental pathology, of which Dr. C. J. Martin is director, the assistants, Miss Harriette Chick, D Sc., and Miss Mabel Rhodes, had been largely occupied in the manufacture of agglutinating serums for the use of the army and navy medical services, and in this department various foodstuffs had been examined for the presence of vitamines, in view of the occurrence of deficiency diseases (beri-beri and scurvy) in some areas of the war. A number of dry portable foodstuffs had been examined with a view to ascertaining those most suited to the cure and prevention of these diseases among the troops. Researches on anaërobic organisms isolated from cases of gas gangrene and other forms of gangrene, undertaken by the director in co-operation with Miss Robertson, had been completed by the latter, who had published a paper on the subject. She was now engaged in an investigation with the object of ascertaining whether an organism isolated by Dr. Penfold from cases of typhus fever conferred immunity against that disease. The calf lymph laboratory had been removed from Bushey to Hayle, Cornwall, where suitable premises had been acquired for a period of five years. The laboratory was under the direction of Dr. Green, and its removal liberated laboratories at Elstree needed for other purposes. The biochemical staff of the Medical Research Committee had occupied several laboratories in the Institute, and accommodation had also been placed at the disposal of the Ministry of Munitions. Mr. Bacot having successfully completed his work in Sierra Leone for the Yellow Fever Commission, returned to the Institute in October, 1915, and has been engaged in investigations on the bionomics of lice, with the object of devising a simple means of sterilizing clothing and preventing infection. Dr. Harden continues to act as deputy director during Dr. Martin's absence. The report was adopted, as was also the financial statement. It was announced that the council had elected Professor F. W. Andrewes, M.D., F.R.S., to be a member of the Governing Body in the room of Sir Henry Roscoe, and that it had also elected to be members of the Governing Body Sir John Rose Bradford and Sir E. Ray Lankester. Sir R. J. Godlee was elected a member of the council in the room of the late Mr. Pattison.

EFFECTS OF WAR ON POPULATION.

AT a meeting of the Royal Statistical Society on May 16th two papers were read in which the changes which are occurring in the age distribution, birth-rate, and death-rate of the population of England and Wales were discussed. Sir J. Athelstane Baines showed that the relative number of the marriageable of both sexes has risen considerably since 1871, but that the number who marry is proportionally smaller. There was also, he said, a tendency to marry later, thereby shortening the productive period, and for the married to have smaller families. A great decline in the birth-rate had been the result.

especially since the beginning of the century. Owing, however, to a similar decline in the death-rate, the rate of natural increase of the population, though generally on the down grade, had been falling more rapidly of late, as the births had been declining in number more than the deaths. The distribution of the population by age and sex had been materially affected. In regard to age, the diminution of the number of children, which set in in the late Seventies of the nineteenth century, at first raised the proportion of adults in the prime of life, and at the most productive ages, and, so far, was economically to the good. It also tended to lower the death-rate, which is at its lowest during adolescence and early middle life. But, as the diminution continued, the people of middle life began to pass into the ranks of veterans, amongst whom the mortality is almost as high as at the beginning of life; the death-rate, therefore, tended to rise and the population to be older, not by reason of greater longevity, but from the lack of reinforcements from below. As the numbers at the productive ages grew smaller. the birth-rate tended to decline, irrespective of less or later marriage or the voluntary restriction of child-bearing. As the mortality of females is considerably lower than that of males, and as it is the men chiefly who leave the country for foreign parts, the balance of sex is slowly inclining more and more on the side of women. The falling off in the marriage-rate is more marked among women than among men, and one of the most important features in the present distribution of population is the rise in the ratio of unmarried women to bachelors. As a counterpoise, to some extent, for this phase in the national life, there is the much wider field now opening for women in occupations of all sorts. Sir Athelstane Baines concluded by expressing the opinion that the short supply of children was not entirely irremediable, since it might be somewhat counteracted by the measures now being put into force for the preservation of infant life. It might be hoped that a relatively greater number would reach maturity. The other paper, by Mr. J. W. Nixon, discussed the effect of war on national vital statistics, and was founded on a study of the effect of the Franco-Prussian war. The statistics of births, deaths and marriages in France and Prussia for the period 1868–73 were analysed, and it was shown that both countries experienced a rise in the death-rate in 1870 and 1871—the increase in the number of "civil" deaths being greater than the number of "military" deaths. This was especially marked in the case of France, the number of "civil" deaths being 437,000 more in 1870–1 than in 1868–69, while the number of "military" deaths was at the most 150,000. The rise in the death-rate was felt at all ages and shared equally by the two sexes. Not only the two belligerents but the three surrounding neutral States of Belgium, Holland and Switzerland all showed a period of maximum mortality in 1871. England and Wales remained unaffected. After the war, rapid recoveries set in in all countries except Prussia, the death-rate in France falling in 1872 to 22.0 per 1,000—the lowest on record. A serious fall in fertility was experienced by France and Prussia in 1871, and the three neighbouring neutrals similarly suffered a reduction in their birth-rates. There was a sudden decrease in marriage-rates in France and Prussia in 1870; it was partly made up in 1871 on the conclusion of peace, but the year 1872 was a "boom" year in both countries, the marriage-rate reaching the highest on record. The war had apparently no effect on illegitimacy, infant mortality, stillbirths, and the proportion of boys born to girls. Mr. Nixon considered corresponding figures for England, France, and Germany in the present war, though the data available are necessarily very limited. As in the Franco-Prussian war, all three countries are experiencing a serious fall in the birth-rate. The death-rate has not yet been seriously affected in England, the slight rise in 1915 being due to some extent to the bad winter and to an epidemic of measles. On the marriage-rate, the effect has been the reverse of that in the Franco-Prussian war—a large rise having taken place last year. The theory advanced early in the war that it was having the effect of increasing the proportion of male births was found to be groundless, as was also the "war baby" theory. The serious effect which the war is having on the vital statistics of the nation was, Mr. Nixon said, to be seen in the fact that the "natural increase" of population in 1913 was 377,000. In 1915 it fell to 252,000, exclusive of deaths of soldiers abroad.

THE LIQUOR RESTRICTIONS.

THE regulations issued by the Central Control Board on February 17th, 1916, for the restriction of liquor traffic possess for members of the medical profession a more than mere academic interest, as has recently been demonstrated by proceedings which have been taken, and to which we shall refer. The regulations, speaking broadly, aim at restricting the number of hours daily during which intoxicating liquor may be supplied in licensed premises, and also provide additional restrictions on the sale of spirits. One of these latter restrictions is that "spirits to be consumed off the premises shall not be sold or supplied in or taken from any licensed premises in any bottle or other vessel not bearing a label showing the name and situation of the premises, or in any vessel of a capacity less than one reputed quart, or in any less quantity than one reputed quart, or in any open vessel." To this, however, an exception is made where a person produces a "certificate in writing, dated and signed by a duly qualified medical practitioner, that the spirits are immediately required for medicinal purposes, and specifying the quantity of spirits required." It will be noticed, therefore, that in order to satisfy this exception, and so entitle its recipient to purchase a quantity of spirits less than a reputed quart, the certificate must satisfy four conditions. It must be dated; it must state that spirits are required medicinally; it must limit the amount of the supply; and, finally, must be signed by a qualified medical practitioner. Now, in the proceedings to which we have already referred, which were taken for breaches of the regulations and which were heard by the Royton Petty Sessions on May 3rd, Dr. Forbes Kinnear of Royton had given one of his patients a certificate in these terms: "Please supply F. M. with whisky, gill quantities, weekly"; and beyond the doctor's signature nothing further appeared on the certificate. The patient's mother, by aid of this certificate, had for some weeks prior to the date of the proceedings obtained a gill of whisky almost weekly at a certain public house in Royton. Three charges were made. The publican was charged with having supplied less than a reputed quart of spirit for consumption off the licensed premises; the patient's mother (S. M.) with carrying away the whisky; and Dr. Kinnear with aiding and abetting in the commission of the offence. Dr. Kinnear, who was represented by a solicitor instructed by Messrs. Hempson for the Medical Defence Union, admitted that the certificate in question did not satisfy the terms of the regulations, with which he was previously unacquainted. He stated that he and his colleagues had met and had agreed that they would charge a shilling apiece for these certificates, and intimated that for the future they would be signed and dated in conformity with the regulations. With this the case against him was dismissed without costs, and the publican was discharged with a caution. Without attempting in any way to criticize the general object with which these regulations were drafted, it would certainly appear unnecessary to put patients requiring small quantities of spirits for medicinal purposes and members of the medical profession to such inconvenience. Suppose a man requires, say, a dose of brandy in an emergency, is he or someone on his behalf, to be compelled to purchase a whole quart, or, as an alternative, to wait until a doctor can be found and a certificate complete in every detail given? Moreover, presumably the doctor would first have to

satisfy himself by seeing the patient that brandy was a medical necessity before he could give the certificate. No doubt if proceedings were taken in such circumstances the bench would consider that a technical offence merely had been committed. But it is to be regretted that those responsible for the conception of these provisions were unable to evolve a simpler method of meeting the point. Under the regulations a medical man must apparently certify each time a supply of spirits is purchased and not merely give a certificate that a weekly supply is necessary. We fail to understand what reason there can be for imposing this burden upon him.

THE FIFTH ARM.

DETAILS given in earlier issues of the physiological tests applied to would-be aviators in this country and in France showed that they were practically tests of "nerve." The training undergone by pupils in the French military aviation school at Buc near Paris, which turns out pilots at the rate of 160 a month, has been described in several recent publications. The pupils are drawn from all branches of the services, and receive a preliminary course of education in the theory of the subject that lasts three or four weeks. Then the pupil is taught to fly by one of two methods. Either he learns by himself, practising first on an aeroplane, nicknamed a "penguin," that can do no more than run along the ground, later he is given one that rises only five or fifteen yards in the air, finally he is put in charge of a normal full-powered aeroplane. Or, alternatively, he is taught to fly in a controlled machine, sitting in front of an expert pilot who controls the levers and steerage as does the learner. This, it is said, is the more natural method of learning to fly. The pupil is up in the air with an expert pilot, and imitates his actions. With a beginner, the expert naturally takes complete command of the situation, and the pupil does little to regulate the flight. As the pupil acquires experience, the expert has less and less to do with the control of the flight. The first thing to be learnt is the art of landing. The flight is short and low, and the pupil's aim is to land at the required spot. Next he must learn to regulate the height at which he flies. All the flights taken are short, and are timed. After they have totalled twenty or five-and-twenty hours, the pupil is fit to go in for his qualifying tests. These consist in three triangular flights round three fixed points—three towns—and a couple of flights ascending to a height of 2,000 metres. Provided he has sound nerves, a strong constitution, and average intelligence, a man may become a pilot in thirty days. It is said that the art of learning to fly is best acquired slowly without undue hurry, and that the intellectual characteristics of the French as a race are just those required of aviators—intellectual concentration, rapidity of judgement, courage, and ease in grappling with the unforeseen. If a flier shows signs that his nerve is becoming affected, he is given furlough and ordered to rest, but Mr. Powell states that so great are the mental strain, exposure, and noise, that probably 25 per cent. of the aviators lose their nerve, and have to leave the service.

SCIENCE, INDUSTRY, AND MEDICINE.

THE annual meeting of the British Science Guild on Wednesday was made notable by an address by Mr. Andrew Fisher, the High Commissioner for the Australian Commonwealth, on the establishment of a national institute of science and industry in Australia. He defined science as the accurate, calculated application of experienced reason to practical problems. Early in the New Year Mr. Hughes, the Australian Premier, assembled representatives in Melbourne of all the universities, industries, and manufactures, and made it clear that the Government would lend its driving power to a movement for the establishment of a scientific institute. What he proposed was a central laboratory and bureau of standards charged with the investigation of industrial problems. An Advisory Committee was appointed which reported within the incredibly short space of a fortnight in favour of a bold policy, recommending that the functions of the institute should be to collect and disse ate scientific information of all kinds, chiefly in connexion with the primary and secondary industries of Australia. Mr. Fisher also touched upon other recent scientific movements in the Commonwealth, and spoke at some length upon the Institute of Tropical Medicine at Townsville, Queensland, inaugurated in the beginning of 1910, and described in these columns not long afterwards. At the present time, Mr. Fisher said, an examination was being made of the blood conditions of children born and reared in North Queensland, with a view to proving whether the blood was normal or whether deterioration had taken place in the direction of anaemia which could be attributed to climatic conditions. As far as statistics had gone, Europeans had a better chance of life in the tropical portions of Australia than in the temperate zone of the continent. It was remarkable that Queensland—largely a tropical State—had at once the highest birth-rate and the lowest infantile death-rate; this was of vital importance to Australia, for it was hoped that it would decide the question of the climatic influence on the white man in the tropics. In proposing a vote of thanks to Mr. Fisher, Sir Alfred Keogh said that there were in the United Kingdom able, energetic, and brilliant scientific men, gifted perhaps above men of other countries in the quality of initiative, but they were fettered by tradition, and there was failure on the part of the nation to take advantage of their discoveries. He pleaded for the linking up of the universities with the industries. The industries should define the university syllabus for special research. In the profession of medicine this principle had been recognized in some measure, but he did not think it held true of any other profession. Speaking of his own department, he said that had it not been for the careful application of science before and during the war, the cases of typhoid fever among the troops—which now in France numbered only twenty-two—would probably have amounted to eighty or ninety thousand.

BENEVOLENT FUND FOR THE R.A.M.C. TERRITORIAL, SPECIAL RESERVE, AND NEW ARMIES.

A MEETING of medical officers of the Territorial, Special Reserve, and new armies to consider further the advisability of establishing, for the benefit of the widows and orphans of officers, non-commissioned officers, and men, some kind of benevolent organization similar to that which exists in the regular Royal Army Medical Corps, will be held at the Royal Army Medical College on Thursday, June 1st, at 2.45 p.m. The magnitude of the interests concerned is shown by the fact that there must be at least 9,000 medical officers belonging to the three categories, and from this some estimate may be formed of the number of non-commissioned officers and men. It is hoped that medical officers will take a lively interest in the proposal, and that as many as possible will attend the meeting on June 1st, when the Director-General, Sir Alfred Keogh, will be in the chair.

AT the meeting of the Medical Society of London on May 15th Mr. D'Arcy Power was elected president, Mr. Hugh Lett and Dr. W. J. Fenton honorary secretaries, and Dr. H. R. Spencer honorary secretary for foreign correspondence.

IN a note on the standard of vision in the army, published last week, the assumption was made that if vision equal to $\frac{6}{24}$ was enough for active service without glasses, $\frac{6}{24}$ with glasses would be sufficient for garrison duty. A correspondent has been good enough to inform us that this assumption is correct, and that an official memorandum was issued last year directing that men "who cannot be brought up to $\frac{6}{24}$ by means of spherical glasses should not be taken . . . for garrison duty."

Medical Notes in Parliament.

War Taxation and Finance.

THE second Budget of 1915 apparently required more parliamentary discussion than had been anticipated, and the latest proposals for obtaining more revenue from taxation have been placed before the Commons in two separate bills in order that more urgent matters may be dealt with at the earliest possible date. The first of these bills has now been disposed of, and the "new" taxes, such as the match duty and the entertainments tax, have now been cast in their final form, but the second has only recently been issued. This division of the Chancellor's proposals into separate bills may possibly absorb more Government time, but has obvious advantages in enabling the necessary administrative machinery to be set up immediately, thereby bringing the new duties into operation at an earlier date than would otherwise have been possible—an advantage not only to the Exchequer, but also to the traders concerned, who would probably prefer almost any trade conditions to those arising from uncertainty as to impending taxation.

We propose to deal with the second Finance Bill—Finance (No. 2) Act, 1916, as it will presumably become—but we may remark in passing that the substantial alterations effected in the mode of levying the match tax, made after the introduction of the first Finance Bill, afford an interesting illustration of the dilemma with which a British Chancellor is faced in proposing new taxes, that is, whether he is to rely mainly on the advice of the permanent officials, or whether he should obtain the opinion of the trade affected, and perhaps thereby run some avoidable risk of permitting an inkling of his proposals to become known in trade circles. Mr. McKenna—like previous Chancellors—seems to adopt the method of framing the system of levy to the best of his ability, trusting to our system of parliamentary discussion to afford ample opportunity for amending and elaborating the administration of the tax with the technical advice and co-operation which British taxpayers are not reluctant to supply where the tax is supported by the general sense of the nation.

Part I of the new bill deals with matters falling under the head of Customs and Excise, and is to a large extent devoted to increasing the duties on cocoa, coffee and coffee substitutes, and sugar, but also deals with customs and licence duties on table waters and cider. The duties on non-alcoholic beverages are to some extent intended to be a measure of justice to the tea merchants, whose commodity has previously borne a proportionately high rate of taxation. Section 10, which is of more interest than importance, may perhaps be mentioned. It imposes a 5s. duty on all "tinder boxes," or, as the bill, with that euphuism so often noticeable in statutory definitions of small articles, describes them, "mechanical and portable contrivances for producing a flame." Naturally the Government do not desire to see their latest tax rendered nugatory by an extended use of match substitutes, and a 5s. duty would seem an ample safeguard against that danger.

Section 11 is of direct importance to the medical profession, inasmuch as it carries into effect the proposed increase in the licences payable on motor cars by substituting a new scale of duties for that laid down in the Finance (1909–10) Act, 1910, and adopted hitherto. Most people will agree that the system of graduating the rates of duty according to the nature of the car—whether on the basis of horse-power, value, accommodation, or otherwise—is equitable, but an unfortunate feature of practically every operative system of graduation is that too much depends on the actual lines of division. For instance, if the car does not exceed 16-h.p., the new licence duty is £8 8s.; if it is between 16-h.p. and 26-h.p., the tax immediately becomes £18 18s. A further subdivision into intermediate groups, according to horse-power, would diminish the number of anomalous cases, but the practical advantages of basing the graduation on a division into groups probably stands in the way of a radical reconstruction of method by which alone all anomalies could be avoided—as, for instance, by the adoption of a system of percentage progression on each unit of horse-power. The actual phraseology of the section appears to suggest no doubt as to the application of the rebate to the new scale of licences.

Part II of the bill deals with income tax—a more serious matter than even the substantial increase in motor licences. There are now three scales of rates: one applying to earned, another to unearned incomes, and a third scale, which is a modification of the earned rates in favour of soldiers and sailors. The super-tax rates are not raised, but the increase of the maximum income tax rate from 3s. for 1915–16 to 5s. for 1916–17 will probably affect the payers of the super-tax to an extent sufficient to prevent any lively feeling of gratitude on their part.

The ordinary income tax rates will apply as follows:

Total Income Not Exceeding	Earned Rate.	Unearned Rate.
£300	2s. 3d.	3s.
£500	2s. 3d.	3s. 6d.
£1,000	2s. 6d.	4s.
£1,500	3s.	4s. 6d.
£2,000	3s. 8d.	4s. 6d.
£2,500	4s. 4d.	5s.
Exceeding £2,500	5s.	5s.

It will be seen from the above that the graduation does not follow the same classification in each case. For instance, there is no special rate applying to earned incomes where the total income does not exceed £300, as in the case of the unearned rates, and the graduation of the latter rates stops at a point below that at which the classification of unearned income ceases. *Prima facie* one would have supposed that it would have been easier to graduate earned incomes according to a £300 limit than unearned incomes, seeing that the former are assessed directly upon the taxpayer and the latter are subjected to tax by deduction at the source. There may, of course, be insuperable difficulties which are not apparent on the surface, and no doubt an opportunity will arise during the debates for explaining their nature. One would certainly be inclined to suppose that if equity requires a graduation at the £300 limit in one case it would also call for a graduation at the same point where earned incomes are concerned.

Section 13 continues the operation of the relief afforded by the second Finance Act of 1914, the principle of which is that where a practice has suffered owing to the war, the average of the three previous years may be discarded in favour of an average of the two previous years and the current year, but the subsequent section grants a mode of relief which is simpler in its operation, and—where it applies—likely to be more fruitful in its results. It provides that where the "actual income" of a taxpayer from all sources for the year of assessment is less by more than 10 per cent. than the income on which he has been assessed and charged—as it may very well be if he is paying tax on an average of previous receipts, and is adversely affected by the war—then he shall be entitled to repayment of tax paid by him to the extent necessary to reduce that sum to the amount of tax on his "actual income." The remarks we have already made as to the tendency of our methods of taxation to sacrifice a logical application of equitable principles to practical simplicity apply with greater propriety here than even to the classification of motor cars for licence purposes. If this relief be given to a taxpayer whose income has fallen 11 per cent., it is difficult to see how in strict equity some measure of relief can be refused to one whose diminution is calculated at 9 per cent., but in point of fact, if this particular question be regarded in the light of the last Finance Act, the taxpayer would appear to have cause for gratitude rather than for complaint. In that Act it was provided that where the diminution exceeded 10 per cent. *some percentage* only, calculated by reference to a statutory scale, of the additional tax paid was repayable. So that, although there is no remedy where the percentage is less than 10 per cent., the complicated repayment by application of a scale is swept away to the clear advantage of the taxpayer. In other words, Section 19 of the present bill constitutes a desirable extension of a previous form of relief, and in such circumstances the "hard case" of the man who still remains outside the 10 per cent. rule—and such cases cannot be very grievous—is not likely to receive much practical legislative sympathy.

The question of applying war rates of taxation to officers in the army and navy has received, and without question will continue to receive, a considerable amount of parlia-

mentary attention. It will be remembered that for 1915–16 the relief given on grounds of military or naval service was restricted to the application of pre-war rates of duty and abatements where the *total* income did not exceed £300. This allowance still holds good, but the bill adds a more precise definition of the persons who can claim this form of relief, and extends the allowance beyond its original scope. The new rates are as follows:

Where the total income does not exceed			£300	...	9d.
,,	,,	,,	£1,000	...	2s. 1d.
,,	,,	,,	£1,500	...	2s. 5d.
,,	,,	,,	£2,000	...	2s. 9d.
,,	,,	,,	£2,500	...	3s. 3d.
,,	,,	exceeds	...	£2,500	3s. 6d.

It will be seen, on comparing these figures with those in the ordinary earned income scale, that there is a reduction which should be quite perceptible, but perhaps the most striking feature is the wide gap between the £300 and the £1,000. The effect of this is to render the section almost inoperative to that very considerable body of officers who, in present circumstances, have a taxable income of between £300 and £500, inasmuch as they receive an allowance of 2d. in the £ only, although the relief is substantial where the total income is greater, gradually reaching a maximum of 1s. 6d. in the £. Bearing in mind, also, the very sudden rise in the rate which takes place when the £300 limit is crossed, we suggest that there are almost overwhelming arguments in favour of a special rate for total incomes between £300 and £500—say, for instance, 1s. 9d.

Another important matter in this connexion is the definition of the class of taxpayer to whom this relief is to apply, and we therefore make no apology for quoting the relevant portions of the two sections concerned *in extenso*:

§ 20. (1) Where any person who during the current income tax year has served or is serving as a member of any of the naval or military forces of the Crown or in service of a naval or military character in connexion with the present war for which payment is made out of money provided by Parliament, or in any work abroad of the British Red Cross Society or the St. John Ambulance Association, or any body with similar objects, claims, etc.; and

§ 21 (1) provides that a person shall not be deemed to have served as a member of the naval or military forces of the Crown unless he has served—

(*a*) On the active list of the navy; or

(*b*) In the army, either with the colours or as an officer on full pay or at a rate of pay which appears to the Income Tax Commissioners concerned, after consultation with the Army Council, to be equivalent to full pay, and either out of the British Islands or for at least one month continuously in the British Islands.

For our present purposes these sections are important because of the large number of practitioners who are engaged on military hospital work in this country. Such work interferes seriously with the ordinary conduct of their civil practices, and frequently involves them in a considerable amount of additional work at a time when they are endeavouring to supply a lack of medical assistance and surgical skill arising from the absence on military service of other practitioners in the same locality. Whether or not such hospital remuneration will be taxed at the special reduced rate will depend on the final form taken by the two sections under consideration. Without attempting to decide whether, in such a case the practitioner would claim to be a member of the forces of the Crown, as defined by Section 21, it appears to us that he would be within the words of Section 20 "in service of a naval or military character in connexion with the present war, for which payment is made out of money provided by Parliament." If there be any doubt on the point it is to be hoped that the coming debates will dissipate it, or lead to the adoption of some other form of words to meet the case.

The remainder of the income tax sections are severely technical and not of substantial importance, with the exception of the somewhat complicated Section 28, which in effect places a maximum income tax of 3s. 6d. so far as the United Kingdom is concerned on colonial income which has already suffered colonial income tax at its source.

Part III of the Bill deals with the excess profits duty, and after increasing the levy for the second war year to 60 per cent., is concerned mainly with questions arising out of the assessments on shipping and munition businesses. This part of the Bill is to our readers a matter of general rather than personal interest.

War.

The Military Service Bill.

The consideration of the Military Service Bill has occupied much of the time of the House of Commons. The report stage was concluded on the evening of May 16th, and the bill was read a third time by 250 to 35. A number of amendments have been made of the exact effect of which it is difficult to judge until the bill has been reprinted. A great deal of interest was shown in an amendment, proposed in the interest primarily of the small shopkeeper, providing for exemption if it is proved that the man is the sole head of the business; that there is no other person available to carry it on; and that he has a wife and children depending upon it. Mr. Duke suggested that the wording of the exemption should be: "On the ground that a man is carrying on business which is a means of livelihood to himself and not less than three other persons depending on him, and which cannot be continued without his services." Mr. Long undertook to issue an instruction under Section 5 to the tribunals, and this undertaking was accepted.

British Prisoners in Germany.

On May 11th Mr. R. McNeill asked a question as to statements made by Mr. Hanson, who has returned to England after eleven months of internment in Germany. The statements were to the effect that not more than 3½ oz. of meat and ½ lb. of bread, composed of a mixture of inferior rye, potatoes, and straw, together with coarse vegetable roots such as were usually fed to cattle, formed the daily allowance of civilian prisoners in Germany, and that the conditions for military prisoners were even worse. Mr. McNeill also asked whether attention had been called to Mr. Hanson's statement that he had frequently heard Mr. Gerard tell starving British prisoners that they had their own Government to thank for their sufferings; and whether any suggestions had been received by the Government from Mr. Gerard as to measures that might be taken to secure better treatment for British prisoners in Germany. Lord Robert Cecil said that quite recently the Government had asked the United States Ambassador in Berlin to inquire as to the quantity and quality of the food at present being supplied at Ruhleben. The United States Ambassador had been indefatigable in his efforts to improve the conditions obtaining in the prisoners' camps in Germany, and the country was most grateful to His Excellency for what he had done. In reply to supplementary questions, Lord Robert Cecil said that he hoped the statements quoted exaggerated the state of things in the camp. He would like to be able to say that such things never occurred, but the Government's information, speaking generally, had been that, although the food was insufficient, it was not so bad as described in the question.

Invalid Prisoners in Switzerland.

On May 10th Lord Robert Cecil said that the agreement under which German and British prisoners of war would be sent to Switzerland, together with a list of the diseases which would qualify for internment in that country, would be circulated very shortly, and Mr. Tennant said that the medical officers in prison camps in Great Britain were preparing a list of those invalid prisoners of war who, in their opinion, should be sent to Switzerland. In reply to questions by Mr. Malcolm, on May 15th, Lord Robert Cecil said that he was unable to state the exact date on which the Swiss Medical Commission to take evidence as to German prisoners in this country qualified by illness to be sent to Switzerland would reach this country. It was understood that the first batch of British prisoners would be sent to Chateau d'Oex and its neighbourhood, and it was hoped that the first batches of prisoners might leave this country and Germany at the end of May.

Jaw Injuries.

Mr. Pennefather, on May 11th, asked how many hospitals there were in this country in which jaw injuries suffered by soldiers could be treated by general surgeons and dental surgeons acting in collaboration, and how many had been established by the French authorities. Mr. Tennant replied that in all hospital centres arrangements had been made for jaw injuries to be treated by general surgeons and dental surgeons acting in concurrent

collaboration. He was not able to say how many special hospitals had been established in France.

Medical Examination of Recruits.—On May 9th Mr. Ashley asked whether it was the case that until recently Southern Command Orders included an order to medical officers of units to at once medically examine all men joining to ascertain whether they were fit for general military service, but that a short time ago medical officers were instructed not to examine recruits, and that a fortnight ago an order was issued in the command that no medical inspection should take place except for infectious diseases. He wished to know whether medical examination by medical officers attached to units would be resumed, so as to avoid waste of public money by inefficient soldiers being retained for a considerable time in the public service. Mr. Tennant said that orders in the Southern Command had been changed in this respect. Previous to the adoption of the system of examination of recruits by selected boards of R.A.M.C. officers, a large number were examined in the first instance by civil medical practitioners, and it was considered necessary that these men on joining their units should be re-examined by the regimental R.A.M.C. officers, as the civil medical practitioners had not always the necessary experience in examining recruits. As all recruits were now examined before enlistment by selected recruiting boards, the second examination by the regimental R.A.M.C. officer was not considered necessary, except for the purpose of detecting infectious disease. As it was unnecessary, public money and public time were saved by its abolition. In reply to a supplementary question, Mr. Tennant said that he presumed the order extended beyond the Southern Command. Mr. Billing, on May 11th, called attention to the fact that men in Hertfordshire were called upon to attend a medical board at Bedford, involving the loss of a day's work and travelling expenses, and asked whether the War Office would make arrangements for a medical board to attend one day a week or one day a fortnight at the chief town at each of the parliamentary constituencies of Hertfordshire. Mr. Tennant said that the question of placing the medical board for Hertfordshire in a more central position was under consideration, but it was impossible to obtain the services of sufficient medical officers to arrange for medical boards to visit the chief towns of all constituencies. If a man concerned was called to the colours, he received a free warrant. If he desired, as it was natural he should, to be examined by a medical board before he was called up, then he was travelling as an ordinary citizen, and was not given a free warrant. Mr. Tennant stated, on May 15th, that no man known rightfully to hold a certificate of rejection on medical grounds issued by an authorized official would be required to be re-examined unless there were reason to believe that his medical disability was temporary or of a nature which did not preclude his employment in some form of military service. There was no form of certificate which exempted a man from all forms of military service. A man might be employed in other categories than general service. He promised, however, to see if some means could be devised for granting a certificate showing in suitable cases that a man was absolutely rejected. On May 15th Mr. Tennant said that he was inquiring into the allegation that in some places married men had been refused facilities for submitting themselves to medical examination in order to ascertain at the earliest possible date whether their services would be required by the army.

Medical Boards.—In reply to Sir Ryland Adkins, on May 15th, Mr. Tennant said that the medical boards by which men previously rejected for the army on medical grounds would be re-examined were those appointed and working in each recruiting area. The presidents were appointed by the War Office and the members in the commands. In reply to a further question as to the propriety of having at least one civilian doctor on each board in view of the fact that the examinations were re-examinations and awakened a great deal of public interest and anxiety, Mr. Tennant said that the War Office was utilizing the services of a large number of civilian doctors. The number of the boards would be sufficient to ensure adequate and proper examination of each individual.

Khaki Helmets.—On May 15th Mr. Tennant told Mr. Malcolm that the Commander-in-Chief of the British Expeditionary Force in France reported that all existing steel helmets were provided with covers or rough paint. The question of which method was the more efficacious was engaging his attention, but he was not in a position to make a recommendation.

Army Dental Treatment.—On May 10th Mr. Tennant informed Mr. Pennefather that he was not able to say how many qualified dental surgeons had been recruited for combatant service, but it was true that qualified dental surgeons were still being recruited for combatant service. He added that full provision for dental surgeons for the army had been made, and that all demands for such service for the troops both at home and abroad had been supplied. There was a large number of applicants for dental commissions, and no difficulty was anticipated in meeting any demands that might remain. The War Office had no information as to the number of dental surgeons employed by the French Government to look after the teeth of French soldiers, nor those employed in the Canadian forces.

Petrol Supplies.—On May 15th Sir H. Craik asked the President of the Board of Trade a question as to the dearth of petrol for necessary purposes, such as the requirements of the medical services in country districts where long distances had to be traversed; and whether regulations would be made to secure that the supply for such necessary purposes should not be interfered with by the use of petrol for purposes of luxury and amusement. Mr. Runciman said that he was aware of the position with regard to petrol and had appointed a Committee to consider what measures were necessary to secure adequate supplies for the purposes of the war and other essential needs, including medical services. The Committee was now inquiring into the whole subject. In reply to a further question by Mr. Cathcart Wason as to whether the regulations of the Board of Trade with reference to railway trains had not accentuated the dearth of petrol by leading to the increase of private motor cars, Mr. Runciman said that he had been making inquiries, but could not find that there had been any increase in the use of private motor cars. So far as he could ascertain, the number in use was lower than before. On May 16th Mr. Cathcart Wason asked whether it would be desirable and practicable to draw a distinction between cars used for business purposes and cars used for pleasure and luxury, so that petrol could be obtained at a more reasonable rate for professional and business purposes. It was, he said, practically impossible for doctors to obtain petrol, owing to its scarcity. Mr. McKenna repudiated responsibility for this, stating that it did not come within the purview of the Home Department.

Motor Car Duties.—On May 10th Mr. Cathcart Wason asked the Chancellor of the Exchequer whether he was aware that the increased taxation of motor cars used by doctors pressed on the medical profession, and that the public interest suffered; and whether he would take into consideration the desirability of making a further concession, with especial consideration to the increased price of petrol and the difficulty of obtaining it. Mr. McKenna replied as follows: "As I have already stated, I am considering all questions relevant to the proposed increase of motor car licence duty; but I must add that it would be difficult to justify any change which would give members of the medical profession — who only pay half duty—a greater proportional preference over other users of motor cars."

Science and Education.—Sir Philip Magnus asked the Prime Minister on May 9th whether, having regard to the general demand for an exhaustive inquiry into the present educational system, particularly with regard to the claims of science to occupy a more important place in the curriculum of schools, he was able to make any statement as to the proposal submitted to him for the appointment of a Royal Commission to consider and to report upon the question of the organization of education in this country. The Prime Minister replied that when the Government was in possession of the results of the various inquiries set on foot it would be possible to decide whether any useful purpose would be served by setting up a Royal Commission. In reply to Mr. Lynch, he expressed his willingness to receive a concrete suggestion for some better method of inquiry than by a Royal Commission.

Dope Poisoning.—In reply to a question by Mr. Bowerman, on May 11th, Mr. Brace, Under Secretary, said that the Home Office had been in constant communication with the departments concerned, and it was understood that the arrangements set on foot some time ago for securing an adequate supply of a satisfactory dope free from tetrachlorethane for use in aircraft works were now approaching completion; it was hoped that the approved dope would shortly be manufactured in such quantities as to meet all requirements. The use of any other non-poisonous dope prepared by private makers must depend on its suitability for aircraft purposes, a matter for the War Office and Admiralty to decide.

Old Age Pensions.—In a written reply to Mr. Wing, on May 9th, Mr. Montagu stated that the total number of old age pensions payable on December 31st, 1915, was 982,384, of which 364,464 were to men and 617,920 to women, the numbers payable at the several rates being:

5s.	4s.	3s.	2s.	1s.
928,085	19,540	19,986	9,697	5,076

THE WAR.

LICE.

DR. ALBRECHT HASE of Jena, who was deputed by the German War Office to study the plague of lice on the eastern front in the summer of 1915, has reported[1] As regards susceptibility to the bite of the body louse, inquiry among nearly a thousand individuals established the existence of the following groups: (*a*) Those whom lice do not frequent although they are in the midst of lice; (*b*) persons who are attacked by lice and continue to be susceptible to their bites over long periods; (*c*) those who are susceptible to begin with, but cease after a time to be affected by the bites although they still harbour the parasites; and (*d*) individuals who have harboured lice for long periods but have never been affected by their bites. No case in which insusceptibility had been replaced by susceptibility was met with.

Groups (*c*) and (*d*) are especially dangerous from the hygienic standpoint since they do not suffer any inconvenience, and consequently have less incentive to free themselves from the vermin. No relation between susceptibility to the bites of fleas and of lice could be made out. One hundred and eighty-one substances were tested for their capacity to protect against infection with lice; the great majority were quite useless, and Dr. Hase comments caustically on the fraud perpetrated by the vendors of these valueless preparations, sold under high-sounding names, at exorbitant prices. The conclusion arrived at is that even the most active substances known, in the largest doses, will not protect the person from lice for more than one or two days. This is confirmed by Galli-Valerio,[2] who finds that lice will even bite through skin covered with substances which cause their death. Some active compounds, such as, for instance, paradichlorbenzol, caused burns of the skin, even when the bags containing it were worn outside the shirt; others, such as clove oil, are too expensive.

There is no clear evidence that close contact with horses protects from or predisposes to lice, nor has any connexion been found to exist between perspiration, hairiness of the body, or previous infectious disease to susceptibility to lice. It is, however, asserted that underclothes heavily soiled with sweat are a protection as compared with clean garments; the explanation suggested is that the soiled garments are comparatively impervious to air and moisture, so that when the wearer works hard in warm weather the atmosphere between the clothes and the skin becomes too close and warm even for the louse. The men had rediscovered for themselves the fact that ants are antagonistic to lice, and some buried their shirts in ant-heaps in order to free them from the pest. When troops are stationary lice can be kept under only by unremitting attention to billets and clothing, and with the co-operation of every individual; where troops are continually being moved any considerable measure of success is impossible. Friedmann[3] has investigated the various procedures for killing the body louse and its nits on clothes and in rooms. Normal nits incubated at 32° C. in an atmosphere containing 40 to 60 per cent. of moisture hatched this way in eight to twelve days. Exposure to air at a temperature of 76° C. for five minutes killed both lice and nits wrapped in wool. He considered that "insect powders" were valueless, and found that lice sought out woollen materials but avoided silk, on which they would not deposit nits. He recommends the vapour of carbon disulphide for killing lice and nits in clothes and rooms. The fluid is exposed in a thin layer in flat dishes, 100 c.cm. being allowed per cubic metre of room space and allowed to act for ten to twelve hours. Clothes are well penetrated, and even furs and skins, which are soon damaged by a temperature of 80° C., are not harmed. Airing soon removes the smell, but it is to be remembered that the vapour cannot be breathed with impunity, and that there is danger from a naked flame. Although carbon disulphide is dearer than sulphurous acid it is to be preferred owing to its volatility and because it is harmless to clothes.

[1] *Centralbl. f. Bakt.*, vol. lxxvii, p. 153.
[2] Ibid., vol. lxxvii, p. 262.
[3] Ibid., vol. 77, p. 322.

DISINFECTION BY HOT AIR.

IN the earliest forms of disinfectors for clothes hot air was used. Probably the best apparatus of the kind was that devised a good many years ago by Ransome. It was a chamber lined with non-conducting material, and had an outlet at the top. The air was heated by gas jets, the temperature of the ingoing hot blast being kept constant by an automatic regulator. The best working temperature was found to be 255° F. (124° C.), which was the highest that could be used for any length of time without risk of singeing cotton goods. This, and the fact that the heat penetrated bulky articles slowly, were the chief objections to it.[1] Hot air, however, is still used for leather articles, india-rubber, furs, and books; for the disinfection of other articles of clothing it has been almost completely displaced by moist heat. Rautmann[2] now claims to have obtained highly satisfactory results by means of a current of dry hot air in an apparatus devised by Vondran. A current of air heated by passing over an electric radiator is propelled into the disinfecting chamber under pressure by an electric motor; the hot current enters at the bottom of the chamber and is drawn out from the top, returning into the blast again. This circulation of the air reduces to a minimum the amount of heat required. To test the penetrating powers of the hot air under these conditions rolls of cotton-wool weighing ½ lb. and 6 in. in diameter and 8 in. long, were exposed in the apparatus for fifty-two minutes; maximum thermometers placed in the centre of the rolls recorded temperatures of 150° C. and upward. By way of control, similar rolls of cotton-wool were exposed to the same temperature in an ordinary hot-air oven, without any special device for producing a current; no rise in the thermometers in the centre of the rolls occurred. The effect of moisture on the penetration was tested with rolls of cotton-wool which weighed 2 lb., and had a diameter of 11 in.; no difference due to the moisture was detected. Leather articles, such as boots and gloves, showed no damage after an exposure of thirty-five minutes to hot air at 178° C., which killed anthrax spores on silk threads. Boots were undamaged, even when they had been soaked in water prior to exposure in the apparatus.

Rautmann's conclusions seem to be based on laboratory experiments, for a small bundle of cotton-wool is a very different thing from a blanket or great-coat, so that although the results are promising, he does not seem to have established the practical value of the apparatus he recommends. If his statements prove even approximately correct, it might prove convenient for the destruction of lice.

[1] Notter and Firth's *Hygiene*. Third edition, 1908, p. 745.
[2] *Centralbl. f. Bakt.*, vol. lxxvii, p. 50.

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Killed in Action.

LIEUTENANT AINSLIE BOOTH, R.A.M.C., whose death in action was noted last week, was killed on April 30th. He was the son of the Rev. Dr. Booth, of Cape Town, South Africa.

Died on Service.

Captain N. J. L. Yellowlees, of the Canadian Army Medical Corps, was reported to have died on service, in the casualty list published on May 11th.

Third-class Assistant Surgeon Joseph Valentine Fernandez, of the Indian Subordinate Medical Department, died on active service in Mesopotamia on December 1st last. He was born on January 22nd, 1885, attained warrant rank in the Bombay Army on December 31st, 1906, and was promoted to the third class on December 31st, 1911. Prior to the war he was stationed at Ahmadnagar.

Wounded.

Captain A. S. Plant, R.A.M.C., temporary.
Captain O. L. V. de Wesselow, R.A.M.C., temporary.
Captain H. F. N. Scott, R.A.M.C., temporary.
Captain F. B. Winfield, R.A.M.C., temporary.
Captain E. J. Blair, R.A.M.C.(T.F.).

Missing.

Captain W. R. O'Farrell, R.A.M.C.

DEATHS AMONG SONS OF MEDICAL MEN.

Allatt, H. T., Colonel Royal Irish Rifles, late Duke of Cornwall's Light Infantry, son of the late Dr. C. J. B. Allatt, died

suddenly on May 8th at Belfast of heart failure, following his exertions in Dublin during the rebellion. He had served in South Africa, and held the Queen's medal with four clasps. He had retired from the army for some years, but rejoined when the war broke out, and was attached to the Royal Irish Rifles. He was on duty in Dublin in charge of an armoured car.

Beatty, Eric Edge, Lieutenant Connaught Rangers, third son of Dr. Wallace Beatty, physician, Adelaide Hospital, Dublin, killed in action on April 29th, 1916, aged 22. He was educated at St. Columba's College and at Trinity College, Dublin, where he was a fourth-year medical student and half-back in the university Rugby fifteen. He got a commission in the 6th Service Battalion of the Connaught Rangers in September, 1914, and was promoted to lieutenant on February 11th, 1915.

Collins, N. H., Second Lieutenant Royal Inniskilling Fusiliers, only son of Dr. Collins of Laghey, county Donegal, killed in action. He was born in May, 1889, educated at Mountjoy school, Dublin, and got his commission on March 15th, 1915.

McConaghey, Charles Jack, Lieutenant Black Watch, son of the late Colonel John McConaghey, I.M.S., killed in action on April 21st–22nd. He was educated at Allhallows, Honiton, and at Bradfield College, Berkshire, and entered the Royal Military College, Sandhurst, in August, 1914. He got his commission on December 16th, 1914, went to Flanders in May, 1915, was wounded in the shoulder at La Bassée in September, and rejoined last February.

Wyatt, William Herbert, Second Lieutenant East Yorkshire Regiment, only son of the late Dr. W. T. Wyatt, was killed in action on May 4th. He was educated at Marlborough and at Exeter College, Oxford, where he graduated as B.A. He represented both his school and his college in the football and hockey teams. He was admitted a solicitor in July, 1913. At the beginning of the war he enlisted in the Artists Rifles, and got a commission on April 23rd, 1915.

Captain Randolph Noel Churchill Murray, Royal Inniskilling Fusiliers, reported missing, is the son of G. M. P. Murray, F.R.C.S.I., of Dublin, and a second-year medical student at Trinity College. Second Lieutenant George Malone, Royal Irish Regiment, wounded in the Dublin rebellion, is also a second-year medical student at Trinity College, Dublin.

NOTES.

MR. J. LYNN THOMAS, C.B., F.R.C.S., Surgeon to the King Edward VII Hospital, Cardiff, has been appointed Consulting Surgeon to the Western Command, with the temporary rank of honorary Lieutenant-Colonel, R.A.M.C. Mr. Lynn Thomas served with the Welsh Hospital in South Africa with the rank of Captain, and received the medal with three clasps. He retired in 1913 with the rank of Major, R.A.M.C.(T.F.).

MESOPOTAMIA.

The Joint Executive Committee of the British Red Cross and the St. John Ambulance Association has received an interim report from its commissioner, Mr. Ridsdale, who arrived in Bombay on April 4th. On his way to Bombay he stopped at Aden, and was able to supply some stores of which the medical officers were in need, and cabled to London, with the result that ice machines, disinfectors, and stores were at once dispatched to Aden. At the same time he was able to arrange with Dr. Ruffer in Alexandria and with the Red Cross commissioner in Egypt to supply additional stores and green vegetables as required. Mr. Ridsdale on his arrival in Bombay seems to have found that the Red Cross voluntary aid work was in an unsatisfactory state, and hampered by the need for constant reference to Simla. At his suggestion the Executive Committee has appointed Major Hepper, agent for the Great Indian Peninsular Railway, to be its commissioner at Bombay. Mr. Ridsdale reported that Lady Willingdon's War Supplies organization was extremely well managed by a committee of business men, and the Executive Committee has arranged to establish a branch in Bombay of an "All India" effort to help the Red Cross side of Lady Willingdon's organization. Owing, apparently, partly to Mr. Ridsdale's efforts in Bombay the audit office there is being prepared, by direction of the Government of India, as a military hospital for white troops. Mr. Ridsdale arrived at Basra on April 16th, and in response to his request a large quantity of stores have been sent out from this country to that port, consisting chiefly of water and air beds, ice machines, wheeled chairs, and medical comforts. It is reported that three motor boats sent out by the Executive Committee have reached Basra, as also two sent by the Scottish Branch of the Red Cross; five other boats are on their way out, and fifteen more will be ready by the end of May. Their arrival is anxiously awaited, as the great difficulty has been in respect of transport. The Executive Committee is also preparing a shallow draught hospital ship for use on the Tigris, very similar in construction to the three hospital ships at present under construction by the Government for river service. It will be remembered that Mr. Ridsdale is a member of the Government Committee of Inquiry into the treatment of the sick and wounded in Mesopotamia, the other members being General Bingley and Sir William Vincent.

SIR JOHN NIXON'S DISPATCH.

CTESIPHON AND KUT.

On May 10th the War Office published a dispatch from General Sir John Nixon, dated January 17th, 1916, on the operations in Mesopotamia during October, November, and December, 1915. This dispatch contains the following references to the work of the medical department:

"The medical services have had to face very trying and unusual conditions. On more than one occasion the number and severity of the casualties have thrown the greatest strain on them, but the organization and efficiency of the arrangements have ensured as speedy an evacuation of the wounded as the means placed at their disposal permitted. In this connexion I wish to bring forward the name of Surgeon-General H. G. Hathaway. . . . The British General Hospital has throughout been in charge of Lieutenant-Colonel D. J. Collins, R.A.M.C., whose zeal, energy, and organizing power have rendered it a model hospital of its kind. Credit is also due to Lieutenant-Colonel G. B. Irvine, I.M.S., for his devoted and careful supervision of the Indian General Hospital."

A the end of the dispatch the names of nineteen officers are specially mentioned; among them is Captain W. H. Hamilton, I.M.S.

HONOURS.

The names of the following officers are included in the list of officers who have been awarded the Distinguished Service Order or the Military Cross in a special supplement to the *London Gazette* of May 16th:

D.S.O.

Temporary Captain Robert McCowan Hill, R.A.M.C. (attached 2nd Battalion Argyll and Sutherland Highlanders), for conspicuous gallantry and devotion to duty. He went to an area which was under intense bombardment, amputated the leg of a wounded officer, and attended to other wounded under most difficult and dangerous circumstances. Finally, he accompanied two stretcher cases back under shell-fire.

Captain R. McCowan Hill graduated M.B., Ch.B.Glasg., and practised in Upper Tooting, S.W., before the war.

Military Cross.

Temporary Captain James Lennox Stewart, M.B., R.A.M.C. (attached 1st Battalion Gordon Highlanders). For conspicuous gallantry and devotion to duty on several occasions when tending the wounded under heavy fire. On one occasion he rallied men, and set a splendid example of coolness and bravery.

Captain J. Lennox Stewart, who received his medical education a Guy's Hospital, took the degrees of M.B., B.S.Lond. in 1912.

Serbian Orders.

The King has granted unrestricted permission for the wearing of the Order of St. Sava, of the class indicated, conferred by His Majesty the King of Serbia on the following members of the Royal Army Medical Corps Mission to Serbia, March to June, 1915:

2nd Class: Temporary Colonel William Hunter, C.B., M.D., F.R.C.P.

3rd Class: Lieutenant-Colonel George E. F. Stammers.

4th Class: Captain Sydney W. Lund, M.B., Mr. William W. C. Topley (late Captain R.A.M.C.).

5th Class: Captains: Norman Cameron, M.B., Edward S. Walls. Temporary Captains: John M. Clements, M.D., Bernard C. Ewens, Alexander K. Forbes, M.B., Charles M. Forster, J. McAdam Hill, M.B., Samuel E. McClatchey, M.B., Charles R. Nicholson, Thomas H. Ravenhill, M.B., Hugh Y. Riddell, M.B., John H. V. Scott, M.B., Philip J. A. Seccombe, M.B., Bryce McC. Smith, M.B., Charles E. H. Smith, Robert H. Spittal, M.B., Lewis A. Walker, M.D., Gerald Whittington, M.B., John S. Williamson, William M. Will, M.B., and Mr. Francis F. Brown (late Lieutenant R.A.M.C.).

Indian Army.

In the *London Gazette* of May 2nd, in a list of Indian officers on whom the Indian Order of Merit had been bestowed, with effect from January 1st, for gallantry and distinguished service in the Dardanelles, was the name of 1st Class Subassistant-Surgeon Ghaus Muhammad, I.S.M.D.

A Correction.

In the list published in our issue of May 6th, p. 670, of those upon whom the honour of C.M.G. had been conferred, the name of the undermentioned officer should have appeared as follows:

Major (temporary Lieutenant-Colonel) Creighton Hutchinson Lindsay, M.D., R.A.M.C.(T.F.).

England and Wales.

THE WELSH NATIONAL MEDICAL SCHOOL.

A TREASURY minute dated April 18th, 1916, on the reports of the Advisory Committee on grants to universities and colleges and of the departmental committee on the National Medical School for Wales, together with copies of these reports, has been issued as a White Paper.

It appears from a memorandum of February 26th, 1914, that the grants to the University of Wales and its three constituent colleges from the Treasury amounted to £31,000, and from local authorities to £2,000. It is proposed that the grant by the Treasury should eventually be increased by £11,000, and the grants by local authorities by £9,000. Pending the report of the Royal Commission recently appointed to inquire into the organization and work of the university and colleges, and into the relations of the university to the colleges and to other institutions in Wales providing education of a post-secondary nature, the Treasury is prepared to concur in the recommendations of the Advisory Committee on university grants. Provided that, pending the reconstitution of the university, the new grants are applied wholly to meet existing liabilities, and conditionally on the continuance of the grant of £2,000 at present contributed by the Cardiff local authority, the Treasury undertakes to include in the Estimates for 1916–17 an additional sum of £5,500 for the first year of the new grants. Of this sum £1,000 will be allocated to the university, £1,125 to Aberystwyth, £1,125 to Bangor, and £2,250 to Cardiff. The Advisory Committee recommended that this State grant should be contingent upon a further sum of £3,500 being raised from the rates during the year in addition to the rate aid already given by Cardiff, but the Treasury is willing to waive this condition during the war. After its termination, however, further State assistance will be contingent upon its fulfilment. The Treasury will then be prepared to pay £500 over and above £5,500 for each further £500 raised by the local authorities until the total additional grant from the Exchequer to the university and the colleges reaches £11,000 a year. The Treasury also concurs in the recommendation that in future the contributions by local authorities should be regarded as support of the university as a whole, and should be allocated between the university and the colleges in the proportions indicated above.

National Medical School.

Subject to the acceptance of the future decision of the Government on the report of the Royal Commission with regard to the control of the National Medical School, and of the postponement until after the war of such part of the work on the new buildings as has not been specifically sanctioned by the Treasury, it will be prepared in due course to make a maximum grant in respect of the medical work of the college on certain conditions. The report of the Advisory Committee, dated February 26th, 1914, contains the following passages:

The most important claim is that for the extension of the medical school. Cardiff is the only centre in Wales where an effective medical school can be conducted, and at the last quinquennial distribution a grant of £1,500 a year was made by the Treasury to enable the College to found a medical school giving instruction in the preliminary and intermediate subjects. The College now desires to complete its medical school by undertaking the final and clinical subjects which hitherto students have had to study either in London or elsewhere. If such a complete school is to compete successfully with the large and well-equipped schools of medicine already in existence elsewhere, and if it is to provide a fitting medical education for students of the Principality, it must, in our opinion, be conceived on the most modern lines and be based on the "unit" system, as described in the recent report of the Royal Commission on University Education in London, with salaried heads, graded assistants, and well-equipped laboratories. The control of the departments in the clinical subjects and the appointment of the staff in charge of those departments must be secured by the close co-operation of the academic authorities with the hospital authorities. The financing of a medical school on these lines is a very serious undertaking.

Even should the establishment of a modern clinical school with a full equipment of medical, surgical, and gynaecological "units" be delayed, additional income would still be needed for the salaries and maintenance of the departments of science ancillary to the study of medicine and surgery and for increasing the efficiency of the instruction in the intermediate subjects. Our estimates of the immediate needs are therefore in the main unaffected by the larger issue we have been obliged to raise.

The Departmental Committee, in a report dated December 9th, 1914, gives the following estimate of the additional sums which would be required for the first ten years:

	£		£
1st year ...	4,565	6th year ...	9,365
2nd ,, ...	6,490	7th ,, ...	8,865
3rd ,, ...	9,240	8th ,, ...	8,490
4th ,, ...	8,990	9th ,, ...	8,240
5th ,, ...	9,990	10th ,, ...	8,115

In its previous report the committee had expressed itself strongly of opinion "that a school of medicine which aims at being national in its character must command support from the Welsh people as a whole and must receive from private donors and local authorities in the Principality adequate contributions for its maintenance." In considering how the additional sums required ought to be apportioned between the Imperial Exchequer and the locality (in this case the Principality) the medical school is designed to serve, the committee was guided by the extent to which local support, both over the whole of Wales and over Cardiff and its vicinity, already contributed towards university education as compared with the position in England. It also took into consideration the amount at present paid by the State in grants to medical schools in other parts of the country. Upon this the report contains the following observations:

3. With regard to the first of these points, we observe that, taking local support as including annual grants from local authorities, income from endowments and annual subscriptions, the ratio of local support to aid from the Exchequer in 1912–13 was 1.33 : 1 for the whole of England, while for the whole of Wales it was not more than 0.33 : 1. In making this comparison we do not wish to be understood as suggesting that the ratio of local support over an area which is in general of relatively low rateable value should be the same as it is in the case of England, of which the rateable value is relatively high, and we realize also that several heavy calls have of recent years been made upon the liberality of the Welsh people for the foundation of other national institutions connected with learning and preventive medicine. But even if these factors are taken as accounting in some degree for the low ratio of local contribution in Wales towards university education, we do suggest that, in a matter in which the interest of the whole country is so strong, and has been of such long standing, a larger measure of support may reasonably be expected.

When we come to consider the individual case of the University College of South Wales and Monmouthshire, which alone of the Welsh university colleges receives a grant for general maintenance from local authorities, the inadequacy of the local contribution stands out more clearly. Cardiff itself, and the districts which this college may be regarded as primarily serving, constitute a very thriving centre of commerce and industry, and their resources are fairly comparable to those of the wealthy English localities which contribute towards the maintenance of the modern English universities and university colleges. But whereas the ratio of local support to Exchequer grant averages, as we have seen, 1.33 : 1 for the English institutions, and in no comparable case sinks below 0.96 : 1; in the case of the college at Cardiff the ratio is only 0.45 : 1. We are convinced that the needs of university education in South Wales demand from Cardiff and the localities concerned a much larger contribution than is at present made if it is to be maintained at a reasonable level of efficiency.

4. The second of the considerations to which we referred above is the degree of assistance already given by the State to medical schools in England. The grants at present forthcoming in aid of these schools are paid by the Board of Education under the "Statement of Grants available in aid of Technological and Professional Work," and in the case of the largest school amounted in 1914–15 to nearly £4,600. This grant of £4,600 was in respect of nearly 300 full-time and about 80 part-time students. Under Regulation 7 of the "Statement" the maximum rates of grant which the Board can pay are £20 per full-time student and £8 per part-time student; but the rates actually paid in no case

reached these figures, and in the great majority fell very considerably below them.

It is in our opinion necessary to bear in mind these grants made by the Board of Education to the medical schools in England in considering what proportion the Exchequer can properly be asked to pay of the large additional sum required to establish in completeness at Cardiff a medical school which at the best will only be moderate in size. If Professor Hepburn's anticipations prove correct, the school will have fifty-three full-time students in the first year of the new conditions and 165 in the fifth year, when the total additional income required will have risen to nearly £10,000. At the same time we realize that due allowance should be made for the fact that the school is to be organized on the "unit system," the expenses of which may be expected to be greater than those entailed by the organization which at present prevails in the medical schools in England.

5. In paragraph 1 of this report we expressed our belief that for the maintenance of a national medical school at Cardiff additional sums will be required, rising from about £4,600 in the first year to about £10,000 in the fifth year. On a review of all the circumstances of the case we have come to the conclusion that half of the additional sums there specified as needed in each of the first five years might appropriately be contributed by the Exchequer on the understanding that an equivalent sum is forthcoming each year from fresh "local support" as defined in paragraph 3 above. Under this arrangement the Exchequer contribution would not in any of the five years exceed £5,000, and in most would fall considerably below that sum. It should be made a further condition of any grant from the Treasury that the share forthcoming from "local support" in each year should, with an equivalent contribution from the Treasury, make up the full amount estimated as necessary for the year.

It may be hoped that once the National Medical School is fairly started the success of its work will secure for it a stability and prestige which will assure its satisfactory development for the future. In view, however, of the fact that the task before the promoters of the scheme, involving as it does the building up on comparatively humble foundations of an important national institution, depends for its successful accomplishment on a variety of circumstances which cannot be foreseen with certainty, we consider that any such financial arrangement as we suggest should be subject to revision at the end of the first five years in the light of the experience which that period has afforded of the working and progress of the school. It is to be noticed that the estimates to which we have referred depend in part at least on the scale of fees proposed in Professor Hepburn's statement (see Appendix IV of interim report). In accepting these estimates we therefore assume that no alteration in this scale will be made during the period in question.

We are aware that if in accordance with our proposals a special grant is made from the Exchequer towards the maintenance of the school, there is a possibility of its overlapping to some extent with a portion of any increased grant to the University College of South Wales and Monmouthshire that might result from a reassessment of the grants to the Welsh university colleges, made on the recommendations of the Board's Advisory Committee on University Grants. This would, however, be a matter for adjustment by the Treasury and does not seem to call for further consideration by this committee, who are here only concerned with recommendations as to a "special grant" in aid of a national medical school for Wales.

The Treasury will not pay a special grant for the National Medical School for the year 1916–17, because the new physiological block is not yet completed and in use, and it is uncertain what the financial requirements of the school will be for this year. Any provision that may be necessary will be made in the estimates for 1917–18 on the receipt of information by January 1st next as to the financial position of the school and the grant likely to be required on the approved basis. The new grant will be conditional on the whole capital cost of the new buildings, including fittings, furniture, and equipment necessary for the complete school, being met entirely from local sources.

LIVERPOOL: INFANT AND MATERNAL WELFARE SCHEME.

A report by Dr. E. W. Hope, M.O.H., gives an account of the measures taken to preserve and protect infant life by antenatal, natal, and post-natal hygiene. The infant mortality-rate is nine times as great as it is among children between 2 and 5 years. One-half of these deaths occurs within three months of birth, and death to a great extent depends on causes operating before birth. The mortality varies widely in different districts of Liverpool; for instance, twice as many children survived the first year period in the Walton as in the Scotland district. The work of the corporation infant welfare centres consisted originally in supplying a suitable food for infants whose mothers were unable to suckle them. They are also made use of for instructing mothers, and at the same time of ensuring the supervision of the feeding of these infants. Infantile cholera ranks as the most fatal disease of infants under 3 months of age, and it was found that deaths from this cause were fifteen times as numerous among artificially fed children as among breast-fed infants. Dr. Hope, while insisting on the importance of breast feeding, urges that every step should be taken to ensure this by antenatal treatment. Systematic home visitation by competent health visitors was inaugurated in 1897. The visitors put the mothers in touch with the Invalid Children's Association, or the various infant welfare centres where help and advice is obtainable, nursing mothers are cared for, and, where there is a lack of proper nourishment, means are taken to provide suitable food, so that the mother's maternal duties are not imperilled.

During the summer months particular attention is paid to the thickly populated districts of the city, and the home storage of food, the destruction of refuse and flies are matters to which householders are invited by cards and personal interviews to give especial care. Dr. Hope strikes a personal note in drawing attention to the qualifications of the health visitor. She should be brought into intimate contact with her surroundings, and display infinite tact towards the householders whom she desires to benefit. The midwives, who attend practically four-fifths of the total number of births, have themselves taken the initiative in advising those patients whom they know from past experience to require medical attention to seek medical aid at an early stage of pregnancy at the corporation antenatal centres. Two female inspectors specially trained to deal with ophthalmia neonatorum have been appointed, and as notification of this disease has been compulsory since April, 1914, no time is lost in bringing the infants under medical treatment. Nine beds and nine cots are reserved in St. Paul's Eye Hospital for these cases, and bacteriological examination is undertaken by the city bacteriologist in any case that is at all suspicious. How important prevention is in ophthalmia neonatorum may be gauged by the fact that over one-third of the inmates of schools for the blind have lost their eyesight from this cause.

In 1914 the mortality from puerperal fever was 1.34 per 1,000 births.

For girls attending the senior classes in the elementary schools a special course of instruction is provided on the "care of the baby," and practical demonstrations in the cutting out and making of a set of infant's first clothes are given.

The Liverpool Maternity Hospital and Ladies' Charity have provided a "rest house" available either for expectant mothers needing temporary rest and observation prior to the birth of the child or for a short period of post-natal tranquillity.

It will thus be seen that Liverpool is thoroughly cognizant of the importance of a healthy and vigorous race, and with a falling birth-rate is leaving no stone unturned to preserve the viability of the child, and thus in a measure stem the loss in population due to disease, and minimize the baneful influence of race suicide.

LONDON.

Infant Mortality.

At the meeting of the London County Council on May 16th, after a report on the subject from the Public Health Committee had been considered, a resolution was passed unanimously expressing regret that adequate steps had not been taken by all the local health authorities in the county effectively to diminish infant mortality and suffering by administering the scheme for maternity and child welfare outlined in the circular of the Local Government Board of July 29th, 1915, on this subject. An addendum by Mr. H. Mills was also agreed to, urging that action should be taken against the delinquent local authorities. It was resolved to communicate the opinion of the council to the Local Government Board.

Residential Treatment of Tuberculosis.

It was agreed to continue the existing agreements with various institutions for the residential treatment of tuberculosis for a further period of twelve months. It was decided also to continue the arrangement with the Metropolitan Asylums Board by which the council has the use of beds at three institutions under the control of that body; the number of adults undergoing residential treatment on January 1st was 112, and of children 236; by March 31st these numbers had been increased to 137 and 289 respectively.

Cases of Mental Defect.

During the first three months of the present year information was received of 105 alleged cases of mental defect in London, while the cases previously tabulated, but dealt with during the same period, numbered 116. Of this total of 221 cases 123 would be dealt with. The information was furnished in 78 of the cases by the local education authority.

Ireland.

WE learn that certain adverse rumours concerning Dr. Maurice Hayes, Honorary Secretary of the Irish Medical War Committee, were in circulation in Belfast, and probably in other parts of Ireland, last week. Dr. Hayes was spending the Easter at Newcastle, co. Down, when the rebellion broke out in Dublin. He returned to Dublin with all speed, and was engaged in the Mater Misericordiae Hospital for the rest of the week, giving attendance to the wounded. He is not related to any other Dr. Hayes in Ireland.

THE REBELLION IN DUBLIN.

We have received the following note from a correspondent who was in Dublin during the insurrection:

The rebels took possession of the College of Surgeons on Easter Monday, and the building was held by them until the following Sunday, when they surrendered. The college overlooks Stephen's Green Park, which had also been occupied by the rebels; when they evacuated it, they fell back on the College of Surgeons. The windows, masonwork, and massive columns in the front of the college show many signs of the heavy rifle fire of the military in their efforts to dislodge the rebels. The building, however, has suffered no irreparable or substantial damage. Previous to and at the time of the outbreak Trinity College was occupied by an Officers' Training Corps, and no attempt was made by the rebels to capture it. Practically no damage was done to the building, notwithstanding that the Officers' Training Corps was early engaged with small bands of the rebels behind the Bank of Ireland (old Parliament House).

In connexion with the charges and counter charges which have been made as regards firing on the Red Cross, I am inclined to believe, as the result of some personal investigation, that there is no foundation for them, and that in those cases in which a few Red Cross workers were injured this was accidental and the result of cross-firing between the military and the rebels. The wounds inflicted by the rebels were of a more varied character, and not so clean as those inflicted by the military. This is accounted for by the fact that many of the rebels were armed with old-fashioned game guns.

THE Local Government Board has issued an Order dated May 15th requiring medical officers of health in England and Wales to furnish to the Army Council particulars of all male persons between the ages of 18 and 45 on January 1st, 1916, who have been notified since February 1st, 1913, as suffering from tuberculosis. The object of the Order is to assist the Army Council in securing that men suffering from tuberculosis are not enlisted into the army. If the M.O.H. has difficulty in ascertaining whether a notified person was within the limits of age, he is instructed to include any doubtful case in the list supplied to the Army Council, which, it is suggested, should be prepared at the same time as the weekly statement of notifications required to be sent to the county medical officer of health. The information is to be regarded as confidential and is to be forwarded to the Secretary of the War Office in a sealed envelope.

Correspondence.

HOW MEDICAL WRITINGS MAY BE GIVEN A MARKED DEVELOPMENT.

SIR,—It is to be regretted that we have never adopted the admirable proposal of Dean Swift, to keep all adjectives under lock and key, and issue them to writers only on payment of a heavy fee. Certain words are so shockingly overworked by medical writers as to call loudly for the establishment of a Society for the Prevention of Cruelty to Adjectives. It would be invidious to quote from any individual writer to illustrate a vice so generally prevalent, and therefore I will disguise the reference by altering the disease; but, *mutatis mutandis*, I recently read in your columns an account that ran much as follows: A marked erythema was followed by a marked ulceration, with a markedly sinuous edge, which spread with marked rapidity, and developed a marked discharge, having a markedly purulent character, increased to a markedly large size, and was accompanied by a marked enlargement of the lymphatic glands. Treatment brought about a marked improvement with marked rapidity, and the ulcer healed, leaving a markedly thickened scar, which became the seat of marked keloid.

I do not suppose that medical writers are wantonly cruel to their adjectives, or that they are intentionally cruel to their readers; but, as Tennyson very truly says, evil is wrought by want of thought as well as by want of heart, and in these writings want of thought is so conspicuous as to arouse doubts of the intelligence of the writers. May I suggest to them that, while this unfortunate adjective and its corresponding adverb are so cruelly worked to death, there are plenty of others, much more vigorous, eating their heads off in the stable? In most cases in which "marked" is used it has no meaning, or what meaning it has is emotional, and not intellectual. It is used as a mere intensitive, and has precisely the same significance as the adjective "bloody" in the mouth of a costermonger. I suggest that when medical writers desire to express some real quality in what they are describing they should choose the adjective which expresses that quality with accuracy. It is certain from the context that when the adjective "marked" is used to express a quality, the quality it is desired to express is not that of bearing a mark. It is used, as far as one can judge, as common form for decided, pronounced, evident, clear, unmistakable, unquestionable, perceptible, tangible, visible, slight, considerable, great, copious, abundant, actual, scanty, prevalent, scattered, occasional, and many more.

Another word that is abominably treated by medical writers is the word "develop." It is remarkable that, whereas patients used to catch, or contract, or exhibit, or manifest, or suffer from, or be attacked by, or have, or get diseases, they now do none of these things. According to medical writers, their patients now develop diseases—especially pneumonia. How they do this I do not know. "To develop" is not, except in photography, a transitive verb; and, although a disease may develop, it can no more be developed than it can be depended, or appeared, or looked. A disease, like many other things, may develop out of something else, or may simply develop. It may depend on something, or something may depend on it. It may appear, or a man may look on it. But a man can no more develop a disease than he can depend it, or appear it, or look it. No doubt he can assist a disease to develop, but this is not what medical writers mean when they say a man "develops" a disease—at least, I think not.

"He was given a pill." It is difficult to say which is more objectionable in this expression—the vile travesty of English or the falsehood. It is a falsehood to say he was given. He was not given. It is the pill that was given, and it was given to him. To put it in his own repulsive jargon, a writer who uses this expression is "developing a marked tendency to be given a kick." If I am again called upon to act as an examiner I shall take care that no candidate who expresses sloppy thought in such sloppy English "is given" (what on earth is the matter with the word "receives"?) a degree.

If a writer wishes to say that his patient was attacked by pneumonia, or received a dose of medicine, why cannot he say so in these words? There is nothing profane, or

obscene, or objectionable about them. If he wishes to say that a rash is copious, let him say that it is copious, and not that it is marked, which it is not. If he wishes to say that his patient is much worse, but finds this expression inadequate to express his emotion, let him not say the patient is markedly worse, which is intellectually silly, and emotionally inadequate: let him say the patient is a thundering sight worse.—I am, etc.,

Parkstone, Dorset, April 24th. CHAS. A. MERCIER.

"THE SOLDIER'S HEART" AND ITS RELATION TO THYROIDISM.

SIR,—My article on the above subject in the BRITISH MEDICAL JOURNAL of April 15th having failed to draw a rejoinder from any of the protagonists with whom I was anxious to measure swords, I shall now bring the discussion to a close so far as I am concerned.

I must express my thanks to Dr. Harry Campbell for his very complimentary remarks. I fully appreciate his interesting observations on the causation of functional nervous disorders by morbid blood plasma, but I was dealing with what I considered to be a distinct entity, whether it be called morbid or functional, due to a definite cause, and I strictly confined my attention to the subject in hand. Moreover, the many toxaemias to which he refers can easily be eliminated in cases of "the soldier's heart."

I am afraid my friend Dr. William Inman has not read my paper carefully, or at least he has not profited thereby. It had nothing whatever to do with the toxic action of cordite, cocaine and veronal, the effects of tea on charwomen and washerwomen, scurvy and beri-beri. He says "tobacco is admittedly a common cause." A common cause of what? Personally I would much rather that soldiers had "tea taken from early morning to late at night" than unboiled water. The great success attending the work of another house-physician of mine, Lieutenant-Colonel Nimmo Walker, in the prevention of typhoid fever in the South African war was due to the fact that he always provided his men with boiled water on march and elsewhere.

The extraordinary confusion which prevails in medical literature is largely due to the fact that medical men will not adhere—probably from the lack of sufficient scientific training—to the dictum of Sir Isaac Newton, "that we should admit no more causes of natural phenomena than such as are both true and sufficient to explain their appearance." Can any one imagine Newton having a dozen causes to explain the fall of an apple?

I think I let Dr. Florence A. Stoney down very gently in my paper. There is no particular reason why I should do so now. I would strongly advise her before she begins to settle questions of priority to read a little more extensively and accurately. I can commend to her attention my letter in the BRITISH MEDICAL JOURNAL of November 20th, 1915, p. 747. The *x*-ray treatment of Graves's disease is now becoming a matter of ancient history, but she grumbles that her secondhand recommendation "got no support from the meeting" of the Royal Society of Medicine on January 18th, 1916. What I complain of is that Fellows of the Royal Society of Medicine, even Dr. Florence A. Stoney, can go about the world blind to the simplest fact until it hits them in the eye. They cannot see the wood for the trees. They are quite ready to give a dozen explanations of anything which they do not understand, like the ancient Fellows of the Royal Society who had a learned disquisition and many reasons why a fish does not displace water, until Charles II asked them to try, and, lo! the fact confuted their theories. The *x*-ray treatment of Graves's disease, or any other disease, should not be in the hands of amateurs. It is a powerful remedy; the dose not easily regulated, can readily work mischief, and, if prescribed by anybody and everybody, may soon fall into desuetude, like its employment in the treatment of splenomedullary leukaemia, in which disease it was first used by Dr. William W. Keen, with, at first, an apparent amount of success. However, Dr. Florence Stoney seems to be an expert in *x*-ray work, and in her hands no ill effects may accrue, but, in the language of a Scotsman, I hae ma doots. She says "that toxic influences play a large part in causing thyroid degeneration," but what has that got to do with cases of hyperthyroidism? Her *x* rays may cause degeneration with a vengeance. It makes me smile to be told by a lady of whose existence I have only been aware since January 22nd, 1916, that my "paper is very valuable as again pressing this connexion." What connexion? I am afraid that accuracy of statement and clearness of definition are not strong points with Dr. Stoney. I suppose I should really have her testimonial framed, but Dr. Stoney must excuse me when I tell her that I am not going to indulge in such extravagance during war time.—I am, etc.,

Liverpool, May 13th. JAMES BARR.

JEJUNOSTOMY AND JEJUNO-COLOSTOMY.

SIR,—Mr. Sampson Handley[1] and Mr. Victor Bonney[2] have raised the very important question of the best treatment of paralytic distension of the bowel from various causes. May I venture to congratulate both of them on their very interesting and suggestive papers, and also upon their success in saving lives under desperate conditions?

The issue is a little confused, for Mr. Handley deals exclusively with cases of general peritonitis with secondary obstruction, whereas Mr. Bonney's six cases include several instances of intestinal obstruction without peritonitis; but apparently these were such desperate cases that it would have been unwise to seek and remove the cause of obstruction in the form of band or kink. It may be remarked, however, that the finding and relieving of an obstruction of the small intestine is often a matter that can be accomplished in a very few minutes, and when this can be done it is clearly very desirable in order to avoid a secondary operation, either to close an artificial anus, or for the relief of recurrent obstruction. Except in extreme cases an effort should be made to ascertain the cause of the obstruction, even if it cannot be immediately removed, for when the obstruction is hopelessly irremovable an enterostomy should not be performed, for a *permanent* artificial anus in the small intestine is intolerable, and the higher it is the more intolerable, for most of the food and fluid are wasted, and the patient gets thin and also miserable from irritation of the skin. In these cases it is far better to make an anastomosis between the bowel above and below the obstruction, although this may involve a greater immediate risk.

1. But although it is clearly desirable to find and remove an obstructing band or kink, it is often necessary to drain the bowel in addition in order to save life.

2. Moreover, there are cases of intestinal obstruction so late and grave that an attempt to find the obstruction is dangerous.

3. In many cases of paralytic distension following peritonitis no very definite obstruction can be found. Moreover, in many of these cases a temporary enterostomy permanently relieves the obstruction.

In these cases, if an operation is to save life it must be speedy and simple. For this reason Mr. Handley's operation of jejuno-colostomy does not recommend itself to me so much as simple enterostomy. Moreover, a permanent fistula between the jejunum and colon is not likely to prove entirely harmless, judging by the history of patients suffering from jejuno-colic fistula following gastro-jejunostomy. These patients suffer from periodic attacks of diarrhoea and malnutrition. For less critical cases ileo-colostomy is especially valuable in the hands of an expert surgeon.

Mr. Handley has already mentioned many objections to jejunostomy as performed by Mr. Bonney,[3] and I agree with him in not having been able to verify Mr. Bonney's three zones of intestine: "(*a*) A collapsed portion; (*b*) a portion above it much distended by gas, but containing no fluid matter; (*c*) a portion above that, distended with gas and fluid matter."

Mr. Bonney thinks it is necessary to drain the upper part of the jejunum. My experience is that it is neither necessary nor wise to drain the intestine so high up. It is not necessary for drainage at least 12 in. above the obstruction usually proves successful. It is not wise because every inch of small intestine is valuable for digestion and absorption. The ideal seems to be a simple, speedy, and efficient method of draining the distended bowel, and requiring no secondary severe operation to close the fistula. If this

[1] BRITISH MEDICAL JOURNAL, April 8th and 29th, 1916.
[2] Ibid., April 22nd, 1916.
[3] Ibid., April 29th, 1916.

ideal could be approached surgeons would not be so averse to draining the small bowel in doubtful cases. For these reasons I strongly recommend the following simple plan, which I have used for years with a fair amount of success.[4]

The selected loop of bowel is drawn out, packed off, and clamped to prevent leakage. A soft rubber tube of quarter-inch internal diameter, and with several side holes close to the end, is inserted through a small opening on the free border of the bowel at least a foot above the obstruction. It is secured to the edges of the opening with a single suture of fine catgut. The tube is passed upwards and the invagination thus produced is confirmed by a few sero-muscular sutures. Thus an airtight junction is made and the gas and liquid contents of the small intestine are freely drained away. As the contents of the small intestine are fluid a large tube is not required, and a small one has great advantages in damaging the bowel much less, so that spontaneous closing of the fistula is far more likely to occur in due course. The loop of bowel is returned into the abdomen amongst other coils, and not on any account is it to be retained outside the abdomen or sewn to the parietal peritoneum. The parietal wound is closed around the tube, and a stitch secures the latter to the skin to prevent any drag upon it. After the vomiting has entirely stopped for twenty-four hours the tube is released from the skin and gently withdrawn. By this time the fine catgut suture fixing the tube to the intestine offers little or no resistance. Peritoneal adhesions form very rapidly and prevent any leakage into the peritoneal cav ty.

As a rule, the fistula soon closes spontaneously. Unless there is an obstruction lower down, it never can become an artificial anus, so that only a small proportion of the intestinal contents escapes through the fistula after the over-distension has been relieved. If the fistula fails to close and the patient is losing ground, the peritoneal cavity is opened between it and the middle line, and the attached loop is clamped and detached from the parietes. The edges of the fistula are freely pared and the opening thus left is closed, so that the suture line is transverse to the axis of the bowel, and no narrowing of the lumen results. Resection with end-to-end union is very rarely required.—I am, etc.,

London, W., May 9th. R. P. ROWLANDS.

THE AMOUNT OF FREE HYPOCHLOROUS ACID IN EUSOL.

SIR,—Our attention has been directed to an error in calculation which has appeared in the papers on eusol published from this department.

The amount of free hypochlorous acid in the solution of eusol made up according to our recommendations was stated to be approximately 0.5 per cent. This should read approximately 0.27 per cent. As we have uniformly stated the weights of the constituents to be used in making the solution, this error does not in any way affect the validity of the results which have been recorded, but the point may have given rise to difficulty when solutions for intravenous injection were being tested by titration.

By following the directions given in our papers (namely, 12.5 grams bleaching powder, 12.5 grams boric acid to 1 litre of water) standard eusol is obtained, of which in general—

1 c.cm. = N/10 sodium arsenite solution
= 0.00354 gram chlorine
= 0.00262 gram hypochlorous acid.

Slight variations from this standard occur, depending on the percentage of "available chlorine" in the bleaching powder. With the best samples the percentage of hypochlorous acid in the solution rises to 0.3, but bleaching powder of *B.P.* standard (30 per cent. available chlorine) gives 0.27 per cent. hypochlorous acid.—We are, etc.,

J. LORRAIN SMITH,
THEODORE RETTIE,

Department of Pathology,
University of Edinburgh,
May 15th, 1916.

THE CONTROL OF VENEREAL DISEASES.

SIR,—As I do not wish to seem to "rail in matters whereof I am ignorant," I will not enter into the discussion of the control of venereal diseases. My sole object is to say a word in regard to the last paragraph of Dr. Helen Wilson's letter of April 28th. To Dr. Wilson, and to all those who entertain the hope that somehow and sometime "moral causes" may become efficacious in preventing venereal disease, I would earnestly recommend the perusal of Sanger's monumental *History of Prostitution*, published by Harper's in 1859, and those three grim chapters wherein Thucydides dwells upon things which, he says, "always have occurred and always will occur so long as the nature of man remains the same" (Bk. III, 82–84).

Sanger (p. 671) says, giving the report of a medical board in New York:

> A Utopian view of the perfectibility of man might look for the remedy to this evil in universal early marriages, in domestic happiness, and in a universal moral sense which will compel men and women to keep their marriage vows. But, taking man as he is, we find the tides of society set with constantly increasing strength against early marriages; that domestic happiness is not synonymous with marriage, whether early or late; and that the moral sense which should teach all men to observe even their solemn promises would be miraculous. . . .
>
> But is there no hope in the societies of moral reform? For the suppression or even the checking of the general vice, none whatever. The association in New York deserves much praise for its zealous benevolence. They have brought back some of these erring women to the paths of virtue, but they have done no more to stop the current of prostitution than he could do to dry up the current of the Hudson who dips water with a bucket.

—I am, etc.,

Cambridge, May 7th. W. J. YOUNG.

ECONOMIC OBSTACLES TO EARLY MARRIAGE.

SIR,—Dr. S. G. Moore, in his Milroy lectures on infant mortality, has left untouched, I think, one aspect of the problem.

We now all agree that the State must give help to expectant and nursing mothers. We must also insist on the importance of encouraging youthful parentage. The present-day tendency to late marriages increases every year. The children of such marriages are either absent, few, weakly, or ailing. They lack the vitality, and are by no means of such value to the State as the children of marriages between 21 and 26 years.

The State wants, not weaklings, but healthy, virile, vigorous citizens. They can only come of early unions. Clearly the State must remove some of the economic obstacles to such unions.—I am, etc.,

Dublin, May 9th. J. C. MCWALTER, M.D., R.A.M.C.

ELECTION OF THE COUNCIL OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

SIR,—Many reforms and changes are, we know, due directly to the war, but there is one change which is badly needed and which the war has made pressing. This change is in the manner of voting for the Council of the Royal College of Surgeons. At present the time is too great for the men of the United Kingdom but does not allow the men in Egypt or India, or those further off, to take any part in the election. At the present time a great many men are going to be disfranchised through serving their country as they are in France, Malta, Salonica, Egypt, and Mesopotamia, and even those within reach of letters, if Australians, will not have the voting papers sent to them as their address must be that in Australia. I should like to inquire if there is any really adequate reason for this time being chosen, and not, say, a period of two or three months to allow all to vote.—I am, etc.,

London, W., May 16th. DUNCAN C. L. FITZWILLIAMS.

THE ELECTION OF DIRECT REPRESENTATIVES ON THE GENERAL MEDICAL COUNCIL.

SIR,—The British Medical Association has proved that it can elect all four of their nominees against all who may be nominated outside the Association. It is an abuse of power not to allow members of the profession resident in England not to have one representative on the Council who are non-members of the Association. The British Medical Association has less than 22,000 members, including those in the British Isles and in all parts of the world. The Association should act with some regard to justice and honour, and give the opportunity for at least one to be sent to the General Medical Council as direct representative of the profession in England who are

[4] *The Operations of Surgery*, vol. ii, p. 333, fig. 183.

non-members of the Association. If the Association persists in always electing all the direct representatives for England, then contests will cease, which would be a matter for regret.—I am, etc.,

Blackpool, May 5th. JNO. BROWN.

*** As it is open to any twelve registered practitioners resident in the constituency to nominate a candidate, it does not seem that there is much substance in Dr. Brown's grievance.

OUR BELGIAN COLLEAGUES AT HOME AND ABROAD.

SUBSCRIPTIONS.

THE subscriptions to the Belgian Doctors' and Pharmacists' Relief Fund received since the last list was published are as follows:

	£	s.	d.
Dr. E. D. H. Carpenter (twelfth donation, total £12)	1	0	0
Royal College of Physicians of Ireland:			
Mr. R. B. Balfour, D.L....	2	2	0
Interest (Ulster Bank),..	0	14	1
Mr. J. H. Toplis	5	5	0
Messrs. J. Hayllar and Son	1	13	1
Mr. A. Chapman	0	6	2
Brighton and Hove Association of Pharmacy ...	4	7	6
Mr. J. W. Bygott	0	5	0
Mr. M. E. Morris	0	5	0

Subscriptions to the Fund should be sent to the Treasurer of the Fund, Dr. H. A. Des Voeux, at 14, Buckingham Gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

The stock of clothes for the Belgian Doctors' and Pharmacists' Relief Fund has nearly been exhausted, and the Directress of the Committee of Clothing earnestly begs for further parcels of garments of all kinds. More especially the following articles are desired: Ladies' and children's summer dresses, stockings, and socks; suits for men; vests; sports coats for boys and girls; thin overcoats or raincoats. Parcels should be addressed Mrs. de Bless, St. Andrew's Parish Room, Palace Street, Westminster.

Universities and Colleges.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

A COMITIA was held on May 11th, Dr. Frederick Taylor, the president, being in the chair.

Admission of Fellows.

The following members were admitted to the Fellowship, having been elected at the previous meeting:

Michael George Foster, M.D.Camb. (Harrogate), John MacLeod Hendrie MacLeod, M.D.Aberd. (London), Henry Lawrence McKisack, M.D. Roy. Univ. Irel. (Belfast), Charles Hewitt Miller, M.D.Camb. (London), Harold Waterlow Wiltshire, M.D.Camb. (London), Charles Ernest Lakin, M.D.Lond. (London), Edward Alfred Cockayne, M.D.Oxf. (London).

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE secretary of the College of Surgeons has issued to the Fellows of the College the annual official circular on the elections. A meeting of the Fellows, he announces, will be held at the College in Lincoln's Inn Fields on Thursday, July 6th, at 3 p.m. for the election of four Fellows into the Council of the College in the vacancies occasioned by the retirement in rotation of Sir Alfred Pearce Gould, K.C.V.O., Mr. William F. Haslam, and Sir W. Arbuthnot Lane, Bt., and by the death of Mr. Stanley Boyd. Blank forms of the requisite notice from a candidate and of his nomination may be obtained on application to the secretary, and the same must be received by him, duly filled up, not later than Friday, June 9th. A voting paper will be sent by post to each Fellow, whose address in the United Kingdom is registered at the College, on Tuesday, June 20th. We are informed that there is much complaint about the very short time allowed for voting. Numerous Fellows are on the Continent, and their voting papers, even if they reach them, can hardly be returned in due time. The secretary particularly requests Fellows of the College to furnish him with their correct addresses.

The following list shows the present composition of the Council:

President.—Sir W. Watson Cheyne, Bt., K.C.M.G., C.B., F.R.S., C. (1) 1897 (substitute), (2) 1901, (3) 1909.

Vice-Presidents.—Sir Frederic S. Eve, C. (1) 1904 (substitute), (2) 1907 (substitute), (3) 1912; Mr. Harrison Cripps, C. (1) 1905 (substitute till 1909), (2) 1909.

Other Members of Council.—Sir A. Pearce Gould, K.C.V.O. (1) 1900, (2) 1908; Sir George H. Makins, K.C.M.G., C. (1) 1903, (2) 1911; Sir Anthony Bowlby, K.C.M.G., C. (1) 1904, (2) 1912; Mr. Charters J. Symonds, C.B., C. (1) 1907, (2) 1915; Mr. W. F. Haslam, C. 1908; Sir W. Arbuthnot Lane, Bt., C. 1908; Mr. Bilton Pollard, C. 1910; Mr. C. A. Ballance, M.V.O., C. (1) 1910 (substitute), (2) 1914; Sir John Bland-Sutton, C. 1910; Mr. D'Arcy Power, C. 1912; Sir Berkeley G. A. Moynihan, C. 1912 (substitute till 1919); Mr. James Ernest Lane, C. 1913; Mr. L. A. Dunn, C. 1913 (substitute till 1919); Mr. H. J. Waring, C. 1913; Mr. Stanley Boyd (deceased), C. 1914; Mr. W. Thorburn, C.B., C. 1914; Mr. W. McAdam Eccles, C. 1914; Mr. C. Ryall, C. (1) 1914 (substitute), (2) 1915; Mr. W. G. Spencer, C. 1915 (substitute till 1919); Mr. F. F. Burghard, C.B., 1915; Mr. H. F. Waterhouse, 1915.

The medical schools are represented as follows:

London:	
St. Bartholomew's	5
Charing Cross	2*
Guy's	3
King's College	2
London	1
Middlesex	2
St. Mary's	1
St. Thomas's	2
University College	1
Westminster	1
Special	1
Total London	21
Provincial:	
Birmingham	1
Leeds	1
Manchester	1
Total Provincial	3
Total Council	24

* One deceased.

CONJOINT BOARD IN ENGLAND.

AT a meeting of Comitia of the Royal College of Physicians on April 27th, and of the Council of the Royal College of Surgeons on May 11th, diplomas of L.R.C.P. and M.R.C.S. were respectively conferred upon the following ninety-nine candidates:

*Hannah K. Alton, K. D. Atteridge, J. Aydon, A. J. Bado, H. J. Bensted, D. S. Brachman, J. P. Bracken, I. R. R. Brogden, A. S. Carter, H. H. Castle, L. A. Célestin, G. E. Chissell, *Hester M. Church, *Mabel C. Clark, A. H. Clarke, P. S. Clarke, H. M. Cohen, W. H. Coldwell, W. M. Crombie, R. C. Davenport, S. G. Dunn, F. Dunphy, M. Dwyer, W. F. Eberli, A. W. F. Edmonds, P. O. Ellison, G. I. Evans, H. S. Evans, L. W. Evans, W. Farquharson, G. Fehrsen, E. A. Fiddian, S. W. Fisk, M. R. V. Ford, A. R. Fuller, D. H. A. Galbraith, G. T. Garraway, S. C. Ghose, C. C. Goodall, F. H. S. Greenish, *Ethne Haigh, J. C. N. Harris, S. F. Harris, A. N. Haworth, N. N. Hayson, W. A. Hotson, E. G. Howell, G. P. B. Huddy, Edith C. Hudgell, S. Hutchinson, T. H. Jackson, B. B. Jareja, W. G. Johnston, A. M. Jones, T. Jones, V. Kameneff, T. L. Kan, R. P. Langford-Jones, E. E. Lightwood, C. W. B. Littlejohn, H. B. Logan, P. G. McEvedy, S. S. Malkani, P. S. Marshall, F. C. Mason, Adeline M. Matland, B. H. Mellon, H. W. L. Molesworth, T. D. Morgan, A. G. Morris, G. Moulson, S. Muttiah, K. V. Muttukumaru, F. Newey, D. C. Norris, A. J. Orenstein, F. C. Ormerod, P. E. D. Pank, G. E. Paul, R. R. Powell, J. N. Puri, H. M. Quackenbos, R. Rau Damodar, C. R. Reckitt, B. T. Rose, P. G. Russell, M. Schwartz, D. M. Smith, W. Steadman, H. G. Stormer, G. C. Swanson, D. G. C. Tasker, H. W. Taylor, G. B. Wild, R. W. Willenberg, G. C. Williams, A. Williams-Walker, C. E. Wise, R. S. Woods.

* Under the Medical Act, 1876.

LONDON SCHOOL OF MEDICINE FOR WOMEN.

THE Dr. Edith Pechey Phipson Post-Graduate Scholarship of the value of £40, awarded annually in June by the Council of the London (Royal Free Hospital) School of Medicine for Women, is open to all medical women, preferably coming from India, or going to work in India, for assistance in post-graduate study; it may be held for three years. Applications on a form which will be supplied must be received by the secretary of the school by May 31st.

The Services.

R.A.M.C. (TERRITORIAL).

Gratuity.

WE are officially informed that officers of the Royal Army Medical Corps (Territorial Force) who resign their commissions owing to unwillingness to undertake the imperial and general service obligation are entitled to the gratuity.

EXCHANGES.

M.O. to Divisional Train, Army Service Corps, probably at home for some time, desires immediate exchange with M.O. in 50th Division abroad.—Apply No. 1950, BRITISH MEDICAL JOURNAL Office, 429, Strand, W.C.

M.O. Wessex Division, at present under canvas at Hursley Park, Winchester, would like to exchange with Territorial M.O. serving under the A.D.M.S., Portsmouth. Address No. 1949, BRITISH MEDICAL JOURNAL Office, 429, Strand, W.C.

Medico-Legal.

ILLEGAL OPERATIONS.

IN the High Court of Justiciary, Edinburgh, on May 4th, Dr. John Thomas Dickie, 37, Lauriston Place, Edinburgh, and Ann Taylor, 4a, Lauriston Gardens, Edinburgh, were charged with having performed illegal operations upon two women, in the one case between June 6th and 13th, 1914, and in the other between January 29th and February 5th, 1916; both the women died. The jury found the prisoners guilty, and the Lord Justice Clerk, in passing sentence of five years' penal servitude on each prisoner, said that it was impossible to regard the offence of which they had been found guilty otherwise than as serious.

Obituary.

ARNOLD WILLIAM WARRINGTON LEA,
M.D.LOND., F.R.C.S.,
MANCHESTER.

ALTHOUGH Dr. Arnold Lea had been in ill health since the autumn of 1914, when he was compelled to retire from practice, the news of his death on May 7th at Southport was received with deep regret by his former colleagues in Manchester.

Dr. Lea, who was in his 49th year, was a son of Mr. Edward Lea of Sandbach, Cheshire, and his maternal uncle was Dr. Warrington of Congleton. He was a student of Owens College, Manchester, and obtained the diploma of M.R.C.S.Eng. in 1889, and that of F.R.C.S. in 1892. He graduated M.B.Lond. in 1890, taking honours in obstetric medicine and forensic medicine, and the gold medal and university scholarship in the former subject. He proceeded to the degree of M.D.Lond. in 1892, and graduated B.Sc.Vict. in 1904.

After holding resident appointments at Queen Charlotte's Hospital, the Manchester Royal Infirmary, and elsewhere, he settled in 1895 in Manchester, and became assistant to the late Sir William Japp Sinclair. In 1897 he joined the staff of the Northern Hospital for Women and Children, Manchester, where he distinguished himself as a sound and enterprising surgeon. In 1905 the Northern amalgamated with St. Mary's Hospital for Women and Children, and Dr. Lea remained on the staff. He took an active part, together with Sir W. Sinclair and Dr. Fothergill, in the foundation of the *Journal of Obstetrics and Gynaecology of the British Empire*. In 1912 he was elected president of the North of England Obstetrical Society. He contributed several papers of high merit to the Obstetrical Society of London, of which he was a Fellow, and to the Northern Obstetrical Society, and wrote an important work on *Puerperal Infection*.

Apart from the eminent position which Dr. Lea had attained as a gynaecologist with a large consulting practice, he had shown from the beginning of his career considerable literary powers. During and for some time after his student days in Manchester he was one of the most attractive speakers at the Manchester Medical Students' Debating Society, taking interest in general, scientific, literary, and especially sociological subjects. He became a member of the Manchester Fortnightly Society, where he frequently took part in discussions, and read several papers showing a highly cultivated literary taste, and eventually he was elected president of the society. Those who knew Dr. Lea intimately realized his sterling qualities as a man as well as his brilliance as a gynaecologist. He was always a delightful companion and faithful friend. About three years ago, largely as a result of overwork, he had a serious nervous breakdown, and was compelled to give up all work for some months. On returning to his duties he hoped to be able to work with his previous energy, but soon found himself compelled to retire permanently, and his death hardly came as a surprise to his numerous friends.

A funeral service for Dr. Arnold Lea was held at St. Chrysostom's Church, Victoria Park, Manchester, on the morning of May 11th, at which Professor Donald, Professor Elliot Smith, Dr. W. E. Fothergill, Colonel J. W. Smith, Dr. Lloyd Roberts, Dr. Fletcher Shaw, and Dr. W. K. Walls attended as representatives of Victoria University. The interment took place at St. Peter's Church, Congleton, in the afternoon.

Dr. C. RONEY SCHOFIELD, of Southport, sends us the following tribute to Dr. Lea's memory:

The evening before his death he had greeted me with his old pleasant smile, though too exhausted to speak or take much interest in what went on around him. Over twenty years of intimate friendship, ending with over a year's close medical attendance on him, has been for me a privilege which I shall recall and value always, for during that time I learnt many lessons that only the example of a life of singular purity in thought, word, and deed can effectually teach.

Arnold Lea possessed a brilliant intellect, but, above all, he had the power of concentration and the gift of memory. His reasoning and deductive powers were logical and sound, while his conclusions invariably gave the impression of being the result of painstaking thought and conscientious research. No mere local fame belonged to him. Lea took a very high place among the English gynaecologists, but I want to speak of the man—the friend I loved. Never have I heard an uncharitable opinion, an unkind word, a harsh criticism pass from his lips on any man he knew. In any discussion that might arise Lea invariably found the way to introduce some excuse for the condemned action, some reason for an apparently malicious act, some virtue which palliated the alleged vice. And these without vehemence and without aggressiveness, but with a smiling gentleness which carried with it a reproof to a possible slanderer and aroused sympathy in the unprejudiced listener. He was ever ready to admire other men's good points, always generous in his estimate of them, and unstinting in his praise. His own achievements and his own methods were rarely referred to, and when he did allude to the latter his tone was almost apologetic, but lacked no enthusiasm when he described some colleague's work in the same direction. This characteristic modesty, together with his infinite charity, was, I think, what so endeared him to his friends. His ready sympathy in trouble, his effectual and shyly given help, his utterly unsuspicious nature—always attributing the best motives to any one's actions—these were the characteristics which make him so bitterly mourned and render his memory undying.

Had he lived a little longer, rewards for his long untiring devotion to his work must have fallen thickly upon him, for he fell ill when the years of toil were fructifying. His short married life, however, was one of intense happiness, as it afforded him through the whole length of his long and tedious illness the alleviation which only the most unselfish, devoted, and skilled wife could have given. While his place among his friends can never be filled, while an undying sorrow has come to his nearest and dearest, they can take some measure of comfort in knowing that what reward may be due to a man who has, by his example, left the world better than he found it, that reward is due to Arnold William Warrington Lea.

Dr. BRIGGS, Professor of Obstetrics and Gynaecology to the University of Liverpool, sends us the following appreciation:

Amongst the many prominent public services of the late Sir William Sinclair, none could have been more impressive than his choice of Dr. Arnold W. W. Lea as lecturer in obstetrics in the Victoria University (then Owens College), Manchester. Dr. Arnold Lea was physically a robust and powerful man with a bright and genial disposition. His extraordinary abilities were reflected in the highest of professional records. The addition then made to our ranks in the North of England has remained one of our happiest possessions. Until Dr. Lea's enormous energy had been too deeply drained by impaired health, there followed one continuous succession of written contributions and loyal services to the branch of the profession he so early adorned.

His book on *Puerperal Infection*, published in 1910, planned beyond the range of a textbook, became the standard work of reference. Evidence of the depth, extent, and difficulties of this work is borne in its pages. Its merit as a personal and professional sacrifice on the author's part is conspicuous in conjunction with the strenuous professional efforts of a junior teacher in an important and growing medical school. Of Dr. Arnold Lea's intense loyalty to Manchester, to its university, to his chief and to his colleagues there was one long, continuous, and convincing manifestation. Manchester in her great strength realizes the gigantic loss of one who had so capably, worthily, and cheerfully shared in the toils of her professional ranks. Dr. Arnold Lea originally came amongst us with the bright and welcome promise of a most brilliant future; he was soon marked as one of our leaders. Our sorrowful hearts mourn his departure, for he was a loving and loved friend to all of us.

C. J. GIBB, M.D.,
CONSULTING SURGEON, THE ROYAL INFIRMARY, NEWCASTLE.

DR. CHARLES JOHN GIBB died in Newcastle-on-Tyne on May 13th, in his 90th year, being the oldest doctor in the Northumbrian capital, where his father, Dr. John Gibb, had practised for forty years. After serving an apprentice-

ship he attended some London and Continental schools, and took the diploma of M.R.C.S. and L.S.A. in 1847. Returning to Newcastle, he became connected with its Royal Infirmary, first as house-surgeon. He was afterwards surgeon to the institution, and remained to his death a member of the consulting staff. In 1853, when a grave epidemic of cholera occurred in Newcastle and more than 1,500 deaths were registered, Dr. C. Gibb took an active part in stamping out the disease, and drew up a report on epidemic cholera, which was published in the same year in the *Medical Times and Gazette*. The degree of M.D. of Durham was conferred on him in 1859. He was attached to the Newcastle-on-Tyne College of Medicine for a time as lecturer on pathology, physiology, and anatomy, and examiner in pathology.

JAMES WILLIAM WHITE,

LATE PROFESSOR OF SURGERY, PHILADELPHIA.

PROFESSOR JAMES WILLIAM WHITE, of Philadelphia, died on April 24th. He had been ill for some months, but the immediate cause of death was pneumonia. He was born in 1850. He was the son of Dr. J. W. White, founder of the Maternity Hospital of Philadelphia, and took the degrees of M.D. and Ph.D. at the University of Pennsylvania in 1871. Soon after graduation he went as a member of the scientific staff of the Hassler expedition under Agassiz. The expedition sailed from Boston on December 4th, 1871, visited the West Indies, the Straits of Magellan, Patagonia, and Tierra del Fuego, both coasts of South America, the Island of Juan Fernandez, the Galapagos Archipelago, Panama, and Mexico, and reached San Francisco on August 31st, 1872. On his return to Philadelphia White was for some years resident surgeon in the Eastern Penitentiary. Then he became associated with Dr. Hayes Agnew, and began a career of forty years as a teacher in his Alma Mater. He was first assistant, then professor of genito-urinary surgery. After some years he became professor of clinical surgery, and later, John Rhea Barton professor of surgery. In 1911 he was appointed a trustee of the University and Emeritus professor of surgery. He was senior surgeon to the University Hospital, and consulting surgeon to the Philadelphia, Jewish, Bryn Mawr, and Maternity Hospitals.

Professor White contributed largely to medical literature. He was joint translator and editor with Simes of Cornil's treatise on syphilis (1875); joint author with W. W. Keen of the *American Textbook of Surgery* (1896) and with Martin of a work on genito-urinary surgery (1897). He was one of the editors of the *Annals of Surgery*, and author of numerous papers on the surgery of the spine, the supposed curative effects of operations *per se*, the topical treatment of focal epilepsy, the Roentgen rays in surgery and other subjects. He also wrote a memoir of Hayes Agnew. On the outbreak of the war he came forward as an ardent supporter of the Allies, and in many letters and pamphlets—*A Primer for Americans*, *A Textbook for Americans*, and *Germany and Democracy*—he vigorously denounced Teutonic aggressiveness. His enthusiasm led him to establish a branch of the American Ambulance in Paris and to take personal charge of it for three months in 1915. His health, which was already undermined, broke down under the strain of the work.

Dr. White in his younger days was a famous swimmer and a good all-round athlete. His belief in the value of athletics led him in 1884 to become professor of physical education in the University of Pennsylvania; that post he held without salary for several years. In 1888 he appeared as a principal in the last duel fought in Philadelphia: it was on a quarrel with a Congressman as to the kind of uniform that should be worn by a surgeon of the City Troop in which he held a commission.

Dr. White was for many years in the habit of taking three months' holiday, and how he began this he explained once to the writer of this note. After ten or twelve years' constant work without a holiday as demonstrator of anatomy and as a teacher of surgery, he was beginning to attain considerable success in practice when his health gave way and his physician insisted upon his taking a long holiday. He obeyed, but in the lowest spirits, feeling that all the results of his strenuous work were to be thrown away. He stayed away the prescribed three months, and returned to find not that the public had forgotten him, but that it was disposed to assume that he would be all the better for his holiday and for the new views in surgery which he would have picked up in Europe. In the succeeding nine months he made twice as much money as he had made in any preceding year, and he drew the wise conclusion that if that was what the public wanted it was for him to humour it. For many years he was an annual visitor to this country, where he made many friends, but latterly had gone to other parts of the world, and in particular made an adventurous journey to Alaska a few years ago.

Dr. White had many distinguished friends in his own country; among them were Henry James, Edwin A. Abbey the historical painter, and John Singer Sargent, who painted his portrait for the University of Pennsylvania after White had received the degree of LL.D. from the University of Aberdeen on the occasion of its quatercentenary in 1906. He was very popular with all sorts and conditions of men, and an idol of students, in whose welfare he always showed the liveliest interest.

DR. F. C. PLUMPTRE HOWES died at his residence in Lincoln on April 25th, aged 75. He studied at King's College, London, and at Edinburgh, and graduated M.D.Edin. in 1864. He was for many years house-surgeon to the Lincoln General Dispensary, where he proved a great friend of the poor, who regretted his retirement in 1896 to engage in private practice. Dr. Howes was a very familiar and popular figure in Lincoln.

DR. JAMES RICHARD LOWNDS died at his residence in Newcastle-on-Tyne on April 28th at the age of 82. He was a native of that town, and studied medicine there, and took the diplomas of M.R.C.S. and L.S.A. in 1855. Dr. Lownds practised first at Walker, near Newcastle, where he was for a time medical officer of health and consulting surgeon to the local hospital. Later in life he established a large practice in Newcastle, and was highly esteemed by his patients. He retired some two years ago, after having been in practice for nearly sixty years. His two sons are both doctors. Dr. Lownds was buried at Jesmond Old Cemetery on May 1st.

DR. TIMOTHY MURPHY of Birmingham died at his residence in Small Heath on April 23, aged 43. Born in 1872, he studied at Queen's College, Cork—his native city—and at Edinburgh and Glasgow, taking the diplomas of L.R.C.P. and L.R.C.S.Edin. and L.F.P.S.Glasg. in 1894. He practised for a time in the Tonypandy area, Wales, and on leaving was presented with a gold watch and guard as an acknowledgement of his valued services. Dr. Murphy set up in practice in Birmingham seventeen years ago, and became a member of the Central Division of the Birmingham Branch of the Association, and for a time member of the Birmingham board of guardians. The poor, together with Dr. Murphy's professional brethren and relatives, attended the requiem mass at St. Michael's, Moor Street, in great numbers. Dr. Murphy leaves a wife and five young children.

DR. ROBERT WALLACE BRUCE SMITH, of Toronto, died on March 28th, after an illness of some months. He was born at Mitchell, Ontario, in 1857, and educated at the Newmarket and Newburg High Schools. He took his medical degree at Victoria University, Toronto, in 1879, and went into practice at Seaforth, Ontario. In 1894 Dr. Bruce Smith was appointed to the staff of the Hamilton Hospital for the Insane, and became superintendent of the Orchard Convalescent House attached to that institution. In 1900 he became assistant medical superintendent of the Brookville Asylum, and four years later was appointed inspector of asylums, hospitals, and charities for the province of Ontario. Dr. Bruce Smith was well known throughout Canada as a specialist in neurology and psychiatry, and a frequent contributor to medical literature. His genial nature made him many friends, and his personal qualities commanded both respect and admiration. In 1908 he made an official tour of the large hospitals of the United Kingdom as a representative of the Ontario Government. In 1894 he was appointed Vice-President of the Canadian Medical Association; in 1905 Vice-President of the Charities and Correction Association; and in 1909 a director of the Canadian Purity Association.

Medical News.

THE Library of the British Medical Association has now received, through the courtesy of Dr. Thurstan Holland of Liverpool, Part I of Section XXII (Radiology) of the International Medical Congress, 1913. The series of the proceedings of that Congress in the Library is thus completed.

IN view of the great increase in the prevalence of venereal disease in Italy caused by the conditions of warfare the Minister of the Interior has issued a circular to all prefects throughout the kingdom calling attention to the necessity of taking active measures against the scourge.

A CHAIR of clinical preventive medicine and hygiene has been established in the University of California, the object being to bring about the most effective possible co-operation between the University and the California State Board of Health. Dr. Wilbur A. Sawyer, secretary and executive officer of the Board, has been appointed to the new chair.

IN the night of Saturday-Sunday next, May 20th–21st, at 2 a.m., the time of all railways, and at post offices and other Government establishments, will be put forward one hour to 3 a.m. This altered time will be used for all ordinary purposes during this summer, and will apply to hours of medical practice, panel or other. It is believed that the alteration will reduce the number of hours during which artificial lighting is used in the evenings.

THE Ingleby lecture before the University of Birmingham will be given this year on Wednesday next at 4.30 p.m. in the medical lecture theatre. The lecturer is Dr. T. Sydney Short, physician to the General Hospital, and the subject chosen is gastric ulcer and its complications.

THE circumstances of the death of the wife of Dr. A. C. Herbert, of Sheerness, were recently the subject of an inquiry by the coroner for Kent. A *post-mortem* examination, confirmed by bacteriological examination, established the fact that death was due to cerebro-spinal fever, and the jury appended to a verdict to that effect the following rider: "The jury desire to express their deepest sympathy with Dr. Herbert in his loss, and feel grieved he should have been put through this painful ordeal as a result of dissatisfaction of relatives, and further sincerely hope that the doctor's career will be in no way affected by this painful inquiry."

Letters, Notes, and Answers.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

THE telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are: (1) EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2631, Gerrard. (2) FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard. (3) MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2634, Gerrard. The address of the Irish office of the British Medical Association is 16, South Frederick Street, Dublin.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

"INDICAN" invites suggestions for treatment of long-continued toxæmia, due either to intestinal intoxication or deep-seated ischio-rectal abscesses, thrice operated on. Symptoms: Severe urticaria, subacute diffuse fibrositis, indican, consistent subnormal temperature 95° to 97°. For the last three months there have been symptoms of mucous colitis, with six to eight motions daily, which have not yielded to diet or drugs.

INCOME TAX.

H. S. took over an additional practice on January 1st, 1916. He has paid one-quarter of the tax assessed on that practice for the financial year 1915–16, and expects to be called upon to pay tax thereon for 1916–17, although the earnings of the corresponding portion of his present practice are now appearing in his own books and will come in for future assessment. Can his wife's income be reckoned separately for purposes of "abatement"?

*** It was decided in the case of Bell *v.* the National Provincial Bank that the purchase and incorporation of a branch into a business constituted a "succession," and rendered the successor liable to account for tax on the average profits earned thereby. It may be presumed that the Revenue officials were relying on that decision in requiring payment of the tax for the quarter to April, 1916. It should be remembered that our correspondent's return for 1915–16 would be based on the average profits for the three years 1912, 1913, and 1914, and it would seem to be not inequitable that on taking over an additional practice he should pay more tax than he would otherwise have done. This remark also applies to 1916–17, seeing that the profits of his new "branch" prior to January 1st, 1916, did not affect our correspondent's books, and therefore do not enter into a computation of his own profits on the average of the three years, 1913, 1914, and 1915. It might be well for H. S. to see the surveyor of taxes and come to an agreement with him as to the probable amount of the profits for 1913, 1914, and 1915 of the practice which is now amalgamated with his own, in order that he may be able to make a return for 1916–17 on the full average.

The wife's income is still reckoned with the husband's for purposes of abatement, except as regards income separately earned by her own personal labour, and then only where the amount of the total joint incomes does not exceed £500 per annum. This still holds good notwithstanding the right of separate assessment under Section 9 of the Finance Act, 1914.

ANSWERS.

PRURITUS OF FACE.

DR. WILLIAM BRAMWELL (Liverpool) writes: In reply to "Country Doctor," if his patient has been long under treatment, he may have noticed that the attacks increase in severity at this time of the year. If so, they are probably due to the ingestion of spring rhubarb. The number of cases suffering from "subcuticular roughness" and those conditions which Dr. Sequeira looks upon as allied to "Hutchinson's summer prurigo" is greatly increased when spring rhubarb is a daily article of dietary, the oxalic acid in the rhubarb being probably responsible for a lowered specific gravity of urine and the consequent retention of toxins; such lowered specific gravity being almost invariably present in such cases and due to a lowered vitality of the kidney eliminative cells, possibly a specific effect of the oxalic acid when there is an insufficiency of lime salts for its combination and elimination as calcium oxalate. The oxalic acid, therefore, or its combinations cause the mischief by its own retention and that of the products of katabolism. Hence a vicious circle is set up which may continue long after rhubarb has gone out of season. Nor will such vicious circle be broken and the numerous ailments it may give rise to in the more susceptible cases be cured until many other articles of diet besides rhubarb which have an irritative or toxic effect on the tissues be entirely expurgated from the dietary. In skin affections from such causes, *x* rays, like sun rays, very naturally do harm, as in "Country Doctor's" patient, and local applications are of very little use. In the BRITISH MEDICAL JOURNAL, 1902, I published a case of urticaria acuta in a child, brought on through an excessive ingestion of spring rhubarb, a writer in a previous issue having recorded a similar experience.

LETTERS, NOTES, ETC.

EMULSIONS FOR WIDAL'S TEST.

DR. ARTHUR HARDEN, Deputy Director, The Lister Institute of Preventive Medicine, Chelsea Gardens, S.W., writes: Dr. Alfred C. Coles, in his paper on "An easy and rapid method of doing Widal's reaction for typhoid" (p. 684), states that "emulsions of dead typhoid bacilli" (for use in the Widal test) can be obtained from the Lister Institute. This statement needs correction. We understand that the standards department of the Pathological School at Oxford is prepared to issue killed standard emulsions of bacteria of the typhoid group to persons requiring them for agglutination work, and it therefore has not been necessary for the Lister Institute to supply such emulsions.

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